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The American Statistician

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The President's Column

Rensis Likert

About six weeks ago, in Chicago, the American Statistical Association held its Annual Meeting—for the one hundred and eighteenth time. Every year since the first one in 1840 there has been an Association conference dedicated to recent developments and current problems.

Today, a glance at the Annual Meeting program shows a tremendous range of subjects, and this is constantly increasing. We are all aware of great diversity within the Association, although sometimes we don't appreciate why there seems to be so much presented in other fields than our own. Walter Hoadley discussed some of these aspects in his Presidential Address at the Annual Meeting—those of you who missed this penetrating presentation will have an opportunity to read it in the March issue of the Journal of ASA.

On a four-day program filled with three, four or even five sessions scheduled simultaneously, it is no wonder that this embarrassment of riches is regarded by some as not a desirable arrangement. The fact is there is constant pressure on the program committee to expand the number of sessions even further. Each Section could readily present a larger program if additional time was made available. As you know the Sections are allotted their number of sessions on a proportion roughly based on their relative sizes in the Association. In addition to all that is presented by our society there will be, at a joint meeting, the combined offerings of as many as ten other associations.

The final joint printed program can be a staggering array of sessions scheduled simultaneously and/or overlapping in time, covering a variety of subjects almost overwhelming in scope. Though this may seem chaotic, in actuality it is a helpful arrangement. First of all, the societies meeting jointly have much in common. What is presented by one is very likely to be of interest to a segment of the members of the other groups meeting together. Second, it enables us to attend, at one time of the year and in one place, the programs of more than one

(Continued on Back Cover)

NEWS

NEW 1959 OFFICERS—REPORT OF DECEMBER BOARD AND COUNCIL MEETING —1959 SECTION OFFICERS—REGIONAL MEETINGS—SESSIONS AND TRAINING PROGRAMS—NEW PUBLICATIONS—JOB OPENINGS

New 1959 Officers

The following new officers were elected in the mail balloting last fall:

President-Elect

MORRIS H. HANSEN, Assistant Director for Statistical Standards, Bureau of the Census

Vice-President (1959-61)

GUY H. ORCUTT, University of Wisconsin

Directors (1959-61)

ALBERT H. BOWKER, Department of Statistics, Stanford University

RAYMOND T. BOWMAN, Bureau of the Budget

Council—Representative-at-Large (1959-61)

JOHN T. MARSHALL, Dominion Bureau of Statistics

Council—District Representatives (1959-60)

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COLIN WHITE, Yale University, New Haven, Connecticut

District No. 2

CHARLES M. ARMSTRONG, New York State Education Department, Albany, New York

District No. 3

PAUL M. DENSEN, The Health Insurance Plan of Greater New York, New York City

District No. 4

MARTIN B. WILK, Bell Telephone Laboratories, Murray Hill, New Jersey

District No. 5

MACOLM B. CATLIN, Corporation for Economic and Industrial Research, Washington, D. C.

District No. 6

DAVID B. DUNCAN, University of North Carolina, Chapel Hill, North Carolina

District No. 7

PAUL R. RIDER, Aeronautical Research Laboratory, Wright-Patterson Air Force Base, Ohio

District No. 8

HERBERT T. DAVID, Iowa State College, Ames, Iowa

District No. 9

EDWIN L. CROW, Boulder Laboratories, Bureau of Standards, Boulder, Colorado

District No. 10

HUGH H. BROWN, California Taxpayers Association, Los Angeles, California

The complete list of officers, including the continuing officers as well as those newly-elected, is printed on the preceding page.

December Board and Council Meeting

The Board of Directors and Council of the American Statistical Association met at the Congress Hotel, Chicago, on December 27, 1958, the first day of the Annual Meeting. In addition to the officers of the Association and most of the Directors and members of the Council, there were present a number of others who had been invited to participate in the discussion of several items.

Omer Miller, Chairman of the Local Arrangements Committee, presented figures on the total registration to date, as well as ticket sales and sales of the Abstracts Booklet. Ralph Burgess, Chairman of the Program Committee, reported that 52 sessions had been organized by the American Statistical Association and 2 had been co-sponsored with other societies. President Walter E. Hoadley thanked Messrs. Miller and Burgess for the fine work of their respective committees. A memorial resolution in connection with the death of Helen Slade Sanders, who had organized the financial outlook annual luncheon for many years, was offered by Martin Gainsbrugh and approved by the Board and Council.

Mr. Hoadley announced the results of the balloting for officers for 1959 (see "ASA Officers for 1959," page 2 of this issue). The year-end reports of sections, committees, and ASA representatives were then presented.

Donald C. Riley, Secretary-Treasurer, reported progress of the establishment of the new Journal, TECHNOMETRICS, being jointly sponsored by the American Statistical Association and the American Society for Quality Control, reported in recent issues of THE AMERICAN STATISTICIAN. The editor, J. Stuart Hunter of Princeton University, has already lined up a number of articles for the first issue, which it is hoped will appear in the spring of 1959. Associate Editors appointed to date are: George Barnard (London, England), Cuthbert Daniel, Marvin Zelen, Carl Bennett, Besse Day and Robert Hader. It has been decided that members of the American Statistical Association and the American Society for Quality Control may subscribe to TECHNOMETRICS at the reduced rate of $6.00 per year. Non-member subscribers will pay $8.00.

A request for a charter for a new chapter in Nebraska was read to the Board. and issuance of a charter was

approved. Mr. Howard L. Jones announced that a proposed chapter was being organized at Springfield, Illinois.

There was a discussion of relationships between ASA and the Biometric Society along with a brief historical retrospect. This culminated in the adoption of a resolution authorizing the President of the American Statistical Association to appoint a committee to work with a like committee from the Biometric Society, Eastern and Western North American Regions, to investigate stronger and closer cooperation between the two groups. The Committee was also empowered to consider mutual arrangements with respect to the journal, BIOMETRICS.

Almarin Phillips, Chairman of the Publications Policy Committee, made a progress report on the publications policy questionnaire. This questionnaire, which had been developed to obtain information on the uses made of the JOURNAL and THE AMERICAN STATISTICIAN and to elicit suggestions for their improvement, was sent to a random sample of 1,733 members of the Association. The total response was 73 percent. Some tabulations have already been made of these interesting and valuable returns, but further analyses are being undertaken, and the full results will be announced later.

The 1958 reports of the Board of Directors and the Secretary-Treasurer were approved, and will be published in the June issue of the JOURNAL. The reports show that the number of persons joining the Association during 1958 exceeded one thousand—the largest yearly total to date. Fewer persons dropped their membership than for many years, so that the total number of members has increased from 5,667 at the start of the year to 6,324 at its close. This record is particularly remarkable during a period of recession. Financially, also, the year was a good one, with a surplus of $4,000 at the end of the year. This surplus was possible even though both the JOURNAL and THE AMERICAN STATISTICIAN cost more than the previous year, and there were increases in other items of expense.

The proposed 1959 budget was reviewed by the Board and Council. The estimated income of $88,050 is expected to slightly exceed the expenses. The Treasurer pointed out, however, that the balance was precarious and could easily become a red item with even a slight further increase in the size of the JOURNAL. The budgeted increase for the JOURNAL and other items is expected to be offset by a rise in membership.

Boyd Ladd reported on the most recent meeting of the Committee on Committees in place of the Chairman, Nathan Keyfitz, who is overseas. The Committee felt that consideration should be given to revision of the ASA Constitution in view of ASA's growth and relationship to the statistical profession and to other societies and because the Constitution provides for its revision ten years after it becomes effective. The Board and Council adopted a resolution calling on the President to appoint a Constitution Committee consisting of two types of members, the first representing the Sections, Districts, etc. of the Association, and the second comprising an executive staff to do the writing. The Committee on Committees also felt that attention should be given by ASA to possible section activity in the new fields of statistical techniques in marketing and advertising research, statistics and management, and computer applications. The Board and Council adopted a motion authorizing the Committee on Committees to conduct exploratory investigation of this possibility. Finally, the suggestion of the Committee on Committees to devote attention to joint sessions on utilizing statistics as applied to the subject matter fields of the sections was referred to the 1959 Program Committee.

Resolutions Adopted at Annual Meeting

The following resolutions, which had been prepared by Boyd Ladd, were adopted at the Association's annual meeting:

1. Resolution of Appreciation to the Local Arrangements Committee

Resolved that the members of the American Statistical Association, and the Board and Council of the Association, express their gratitude to Mr. Omer Miller for his very substantial efforts as Chairman of the Local Arrangements Committee for the 1958 Annual Meeting of the Association. We acknowledge with appreciation the very large amount of work done by other members of the Local Arrangements Committee, with the support and cooperation of many other Chicago people and institutions, including the Pick-Congress Hotel.

2. Resolution of Commendation for the Program of the Meeting

Resolved that the members and officers of the American Statistical Association record their especial thanks to Mr. Ralph Burgess as Chairman of the Program Committee and to the many others who helped to provide an excellent program. The selection of topics and the timing of the schedule of sessions have contributed substantially to the usefulness of this 118th Annual Meeting of the ASA. The program participants, the organizers of sessions, Section representatives and others of the Program Committee have done a good job, and we extend our thanks.

Biometric Society (WNAR) 1959 Annual Meeting

The Biometric Society (Western North American Region) annual meeting will be held on June 15-16, 1959 in San Diego, affiliated with the annual meeting of the Pacific Division of the American Association for the Advancement of Science. Visitors from other Regions are cordially invited to attend.

Further information on accommodations may be obtained from Dr. George A. Lindsay, Natural History

Museum, Balboa Park, San Diego.

The final program will be available about April 15 from Sec./Treas., WNAR, The Biometric Society, U. S. Naval Radiological Defense Lab., San Francisco 24, California

Tentative session titles are:

Fisheries Statistics
Medical Statistics
Genetics and Agriculture
Contributed papers

Abstracts of contributed papers should be sent to the program chairman, Dr. William F. Taylor, School of Public Health, University of California, Berkeley 4, California

Joint Meeting of Biometric Society (ENAR), IMS and SPES

As noted in the December issue, the Biometric Society (Eastern North American Region), the Institute of Mathematical Statistics and the Section on Physical and Engineering Sciences of the American Statistical Association will meet on March 19 to 21 at the University of Pittsburgh. The host hotel will be the Webster Hall. Some of the sessions which have been scheduled are: "Sampling" with Morris Hansen, Bureau of the Census, Donovan Thompson, University of Pittsburgh, and Alan Ross, University of Kentucky Medical Center; "Uses of Life Table Analysis in Health Research" with papers by Sidney Cutler, National Institutes of Health, Fred Ederer, National Institutes of Health, and Mary Ellen Patno, University of Pittsburgh; "Uses of Statistical Methods in Epidemiology" with papers by Nathan Mantel, National Institutes of Health, and Abraham F. Lilienfeld, Johns Hopkins University; and "Bioassays." All sessions will be joint except the sessions on contributed papers. Dr. Theodore Horner, Secretary-Treasurer, Biometric Society (ENAR), General Mills, Inc., Minneapolis, is coordinating the program.

The American Statistical Association will mail copies of the final program to members of the Section on Physical and Engineering Sciences at the same time the program is mailed by the Institute of Mathematical Statistics and the Biometric Society (ENAR) to their members.

Election of Section Officers

The **Business and Economic Statistics Section** elected the following new officers as a result of the mail balloting last fall:

Chairman-Elect (1960)—James W. Knowles, Joint Economic Committee, U. S. Congress

Program Chairman-Elect (1960)—Robert J. Eggert, Ford Motor Company

Regional Activities Chairman—Harry S. Schwartz, Federal Reserve Bank of San Francisco

Publications Chairman—Albert T. Sommers, National Industrial Conference Board

Secretary-Treasurer—Kenneth M. Wright, Life Insurance Association of America

Continuing officers of the Section for 1959 are William H. Shaw, Chairman, and David C. Melnicoff, Program Chairman.

The **Biometrics Section** had elected Spencer M. Free, Jr., Smith, Kline and French Laboratories, as Chairman-Elect. Dr. Free resigned, however, because of pressure of other duties, and at the annual business meeting of the Section, Paul Meier, University of Chicago, was elected in his stead. Other officers elected in the mail balloting are:

Secretary—Clyde Y. Kramer, Virginia Polytechnic Institute

Executive Committee—Vincent Schultz, University of Maryland, Jack I. Northam, The Upjohn Company

Continuing officers of the Section are Marvin Schneiderman, Chairman, and the following members of the Executive Committee: Glenn L. Burrows, Mavis Carroll, Bernard G. Greenberg, and Calvin Zippin.

The **Section on Physical and Engineering Sciences** elected the following:

Chairman-Elect—Paul R. Rider, Wright Air Development Center

Secretary—James L. Dolby, General Electric Company

Cuthbert Daniel, Chairman (1959) is the only continuing officer.

The **Social Statistics Section** chose the following new officers:

Chairman-Elect—Frederick F. Stephan, Princeton University

Vice-Chairman (2-year term, 1959-60)—Edwin D. Goldfield, Bureau of the Census

The continuing officers are Walt R. Simmons, Chairman; Daniel O. Price, Vice-Chairman; and William Hodgkinson, Jr., Secretary.

The **Section on Training of Statisticians** elected new officers as follows:

Chairman-Elect—Robert Ferber, University of Illinois

Committee Members (2-year terms, 1959-60)—Ernest Kurnow, New York University; William Wasserman, Syracuse University

The following officers continue during 1959: B. G. Greenberg as Chairman, and W. O. Ash, C. L. Dedrick and John Firestone as Committee Members.

Southern Regional Graduate Summer Session In Statistics

The 1959 session of the Southern Regional Graduate Summer Session in Statistics will be held at North Carolina State College, Raleigh, from June 8 to July 17, 1959. North Carolina State College, Virginia Polytechnic Institute, University of Florida, and Oklahoma State University have agreed to operate a continuing program of

graduate summer sessions in statistics to be held at each institution in rotation; the program was instituted at Virginia Polytechnic Institute in the summer of 1954.

The 1959 session, like previous sessions under this program, is intended to serve: (1) teachers of introductory statistical courses who want formal training in modern statistics; (2) research and professional workers who want intensive instruction in basic statistical concepts and modern statistical methodology; (3) professional statisticians who wish to keep informed about advanced specialized theory and methods; (4) prospective candidates for graduate degrees in statistics; and (5) graduate students in other fields who desire supporting work in statistics.

The session will last six weeks and courses will carry three semester hours of credit. Not more than two courses may be taken for credit at any one session. The summer work in statistics may be applied as residence credit at any of the cooperating institutions, as well as certain other universities, in partial fulfillment of the requirements for a graduate degree. The program may be entered at any session, and consecutive courses will follow in successive summers.

The courses to be offered in statistics in 1959 at Raleigh are as follows: Statistical Methods I and II; Statistical Theory I, II and III; Theory of Sampling Applied to Survey Design; Stochastic Processes and Their Applications; Methods of Operations Research; and Advanced Topics in Statistical Methods. In addition, a number of courses in the Mathematics Department will be available.

The National Science Foundation is offering grants to college teachers of introductory statistics who wish to attend the 1959 session. The stipend is $75 per week for the six weeks of the session, plus additional amounts for dependents and travel allowances. Applicants for these grants will be selected on the basis of interest in continued teaching of statistics, evidence of excellence as a teacher, previous academic record of the applicant, number of introductory statistics courses now teaching, and number of students contacted. Applications must be received not later than February 16, 1959 to be assured of full consideration.

Requests for application blanks for the summer school and for National Science Foundation grants should be addressed to F. E. McVay, Department of Experimental Statistics, North Carolina State College, Raleigh, North Carolina.

New Training Program in Community Mental Health Research

The Social Science Institute of Washington University, St. Louis, announces appointments in community mental health research for students who seek the Ph.D. degree in anthropology, psychology, sociology or related social sciences. This program is designed to prepare students for research positions involving the application of social science theory and method to the mental health field. Support for the program is provided by the National Institute of Mental Health, National Institutes of Health, United States Public Health Service.

Training will be integrated around a core curriculum consisting of classroom instruction and field activities. The requirements of this program are those of the Graduate School and its departments. In addition to the offerings of the academic department of the student's choice, special seminars and lectures will be open to appointees in epidemiology, natural history of disease, preventive intervention, psychiatry, applications of social science to health affairs, and methods of community health research. Other important educational opportunities will be provided by participation in the following activities: Psychiatric Grand Rounds, Medical Psychology Staff Conferences, Juvenile Court Conference, Child Guidance Clinic Diagnostic and Treatment Conferences, Psychology Colloquium, Sociology Colloquium, and Social Science Institute Conferences. Also available to the students are computer facilities at the University. Training facilities include the St. Louis County Health Department, Washington University School of Medicine and five affiliated hospitals, and other community mental health agencies in the St. Louis metropolitan area.

Applications will be considered from those students who have completed one year of graduate training in one of the social sciences. The maximum stipend is $2400.

Applications for appointments should be made by February 27, 1959, and should be directed to: Professor N. J. Demerath, Director, Social Science Institute, Washington University, St. Louis 5, Missouri.

ASA Sponsored Sessions at AAAS Annual Meeting

The American Statistical Association sponsored two sessions at the 1958 Annual Meeting of the American Association for the Advancement of Science which was held in Washington the last of December. The first of these was a joint program of the ASA, the Econometric Society, and the AAAS Section K—Social and Economic Sciences, "Invited Papers: Statistical Methods in the 1960 Census." Peyton Stapp, Office of Statistical Standards, U. S. Bureau of the Budget, chaired the meeting. Papers on "New Applications of Electronic Data Processing to Census Work" by James L. McPherson and Robert F. Drury, Bureau of the Census; "Sampling Applications in the 1960 Census" by Joseph Steinberg of the Population Division and Joseph Waksburg of the Housing Division, Bureau of the Census, and "Experimental Work in the 1960 Census" by William N. Hurwitz and Harold Nisselson, Statistical Research Division, Bureau of the Census were presented.

The second session was also a joint program of ASA, the Econometric Society, and Section K on "Invited Papers: Some Developments in Statistical Economics." Ezra Glaser, National Analysts, Inc., was chairman of

the session, which had been arranged by him. Papers by David Rosenblatt, American University, entitled "On Stochastic Process Representations of Economic Activity"; and by Stedman B. Noble, Logistics Research Project, George Washington University, on "Statistical Designs for Resource Flow Models," were read.

Copies of the papers may be obtained by writing the authors.

Study of Economic Factors Affecting Graduate Student Careers

A steering committee composed of representatives of the Social Science Research Council, the National Research Council and the American Council of Learned Societies is directing a study of economic factors affecting graduate student careers. The investigation is being conducted under contract by the National Opinion Research Center and is supported by a grant from the Ford Foundation. Data on finances and career plans are being obtained from 3,000 graduate students in a sample of graduate schools throughout the country. The same students will again be canvassed next year. This sample will be supplemented with one of individuals who have left the campuses with the intention of completing doctoral theses in absentia, in order to get an understanding of the total influence of economic factors from the beginning of graduate study to the time the doctoral degree is received. A report on the study is scheduled for completion by the end of 1960.

Symposium on Boundary Problems in Differential Equations

A Symposium on Boundary Problems in Differential Equations, with especial reference to recent developments in this field, will be held by the Mathematics Research Center, United States Army, at the University of Wisconsin, April 20-22, 1959. About 20 invited speakers, both American and European, will each present a thirty-minute paper. Both ordinary and partial differential equations will be considered, the emphasis to be upon methods that are potentially adapted to computation. Between lectures there will be discussion periods and coffee breaks. The proceedings of the Symposium will be published.

Persons interested in attending the symposium may receive the program and other details by writing to:

R. E. Langer, Director
Mathematics Research Center, U. S. Army
1118 West John Street
Madison 6, Wisconsin

NSF Study of Russian Expenditures on Scientific Research and Development

The Center for International Studies of the Massachusetts Institute of Technology is conducting a study of scientific research and development expenditures and manpower in the U.S.S.R. for the National Science Foundation. Professor Alexander Korol, author of "Soviet Education for Science and Technology," is serving as principal investigator. Concerned primarily with selected fields of the natural sciences, the study will include an analysis of how the Soviets allocate economic and manpower resources to various fields of research and development. Data will be compiled on a basis as comparable as possible with similar data for the United States.

To make the study as accurate and complete as possible, the Foundation invites communications from scientists who have visited Soviet laboratories and from specialists in the Soviet field interested in this problem. Reference to significant published studies and those now in progress in the United States or elsewhere will be appreciated. Also desired are unpublished memoranda and reports which will be returned if requested.

Communications should be addressed to Dr. Jacob Perlman, Head, Office of Special Studies, National Science Foundation, Washington 25, D. C.

New Magazine in Office Automation Field

The first issue of a new bi-monthly magazine, *Machine Accounting and Data Processing*, was published in November 1958. The magazine will include material related to methods and management in the automatic office, and is designed to serve both planners and practitioners. Each issue will deal with a particular theme. The charter issue was concerned with "The Future of Punched Cards in an Automatic Office." Succeeding issues will carry as theme features, "The Role of Punched Paper Tape in the Automatic Office," "A Closer Look at Computer Feasibility," and "Getting the Most from Your Supplies, Services and Card and Tape Handling Equipment."

Other articles in the first issue are titled: "Rental vs. Purchase," "Job Cost Estimating," "Special Purpose Equipment," "Scheduling in the Data Processing Department," "Centralized Computer," and "650 Evaluation for Production Control." In addition, there is a report on the International Systems Meeting held at Buffalo, October 13-15, 1958, and several departments such as book reviews, a calendar of coming events, and news about people and organizations.

Machine Accounting and Data Processing is published by Gille Associates, Inc., 956 Maccabees Building, Detroit, who also publish *The Punched Card* semi-annually. The editor is Eugene F. Murphy, with editorial offices at 270 Madison Avenue, New York. The subscription rate is $7.50 per year.

Copies of World Health Organization Report Available

A limited number of copies of the fifth report of the World Health Organization's Expert Committee on Health Statistics (No. 133) are available. This is a report of the

proceedings of the session held at Geneva, December 10 to 14, 1956, which dealt with morbidity statistics, the establishment of national committees on vital and health statistics, the collection of health statistics in under-developed areas, the role of the World Health Organization in the training of statistical workers, hospital morbidity statistics, health indicators in connection with the United Nation's study on definition and measurement of standards and levels of living, and other topics. Copies may be obtained from the National Office of Vital Statistics, Public Health Service, Washington 25, D. C.

Job Openings

The Air Materiel Command, which is the agency of the Air Force responsible for procuring, storing, distributing and maintaining Air Force material, has announced a Command-wide Operations Analysis program. As part of this program, an Operations Analysis Office has been established at Headquarters, Air Materiel Command, Wright-Patterson Air Force Base. The program is designed to bring operations research techniques to bear on logistics problems. Vacancies exist for Mathematical Statisticians and Econometricians in salary ranges from $8330 through $12,770 per year. Interested persons should write to Headquarters, Air Materiel Command, Wright-Patterson Air Force Base, Ohio, Attention: Mr. Saul Hoch, MCFR.

International STATISTICAL ACTIVITIES

Members of the ASA are invited to contribute news items or notes on international statistical activities for publication in this section. Suggestions about possible news sources will also be welcomed.

VISITING SCHOLARS IN THE U.S.

There appears on these pages a list of scholars visiting in the U. S. during 1958-59, whose work is in statistics and probability or in applications of these techniques. The list was compiled from (1) the list of visiting foreign mathematicians issued by the Division of Mathematics of the National Academy of Sciences-National Research Council, and (2) the register of visiting scholars published by the Committee on International Exchange of Persons of the Conference Board of Associated Research Councils. Some additional entries in the list have been taken from various professional journals.

Additional information about visiting scholars in statistics and related fields will be appreciated.

AUSTRALIA

The **Statistical Society of New South Wales** was founded in 1947 and is the only society in Australia concerned with all aspects of statistics and related fields. Among its activities are general and section meetings and symposia. The latter have been attended by people from all over Australia. It has also published a *Bulletin*—the present editor is H. S. Konijn—which in recent years has improved in appearance and content, and has received a wider distribution.

The Society has now been enabled to issue a printed journal to be called *The Australian Journal of Statistics*, and to be issued three times a year. The Editorial Board consists of H. S. Konijn, H. O. Lancaster and R. S. G. Rutherford (address: The University of Sydney, Sydney, Australia). The Journal expects to have contributions from Australia and abroad in the field of statistical theory and applications. Prospective authors are requested to send for a list of instructions regarding the form of the manuscripts. Issues will be available to nonmembers at 10 shillings a copy.

—Dr. H. S. Konijn
University of Sydney

INDIA

The **India Society of Agricultural Statistics** has announced plans for awarding Prizes and Research Assistance, for the promotion of research in statistics.

Prizes will be awarded biennially for articles of sufficiently high merit published in the *Journal* of the Society. One Prize will be awarded in each of the following fields:

a) Design of Experiments
b) Sampling
c) Statistical Genetics
d) Statistical Theory and Methodology

VISITING SCHOLARS IN THE UNITED STATES

Name	Home Country	Host Institution	Period of Visit
BOFINGER, Victor J.	Australia	North Carolina State College	1957-59
GALTUNG, Johan	Norway	Columbia University	1957-59
HAMMERSLEY, J. M.	Great Britain	University of Illinois	1958-59 [a]
HELMS, Hans J. A.	Denmark	Tufts University	1958-59 [b]
JAMES, Alan T.	Australia	Yale University	1958-59
LAHA, R. G.	India	Catholic University	1957-59
MATUSITA, Kameo	Japan	Princeton University	1958-59
OGAWA, Junjiro	Japan	University of North Carolina	1958-59
REUTER, G. E.	United Kingdom	Yale University	1958-59
SARGAN, John Denis	United Kingdom	University of Minnesota	1958-59
SCHMIDT, P. F.	Denmark	University of Minnesota	1958-59
VAN DER VAART, H. R.	Netherlands	University of Chicago	1958-59
VANDOME, Peter	United Kingdom	University of Kentucky	1958-59
VOGEL, Walter	Germany	University of Chicago	1958-59
WATSON, G. S.	Australia	Princeton University	1958-59
WOLD, Herman	Sweden	Columbia University	1958-59

[a] First semester only
[b] "1958-59" means a period roughly coinciding with the academic year.

Research Assistance grants, contributing toward travel expenses and other facilities will be awarded (initially) to five individuals who have shown evidence of interest in research. The applicants should preferably be affiliated with universities or similar institutions. Research work done by the recipients of these awards must be submitted for publication in the *Journal* of the Society.

Further details of the terms and conditions of the awards were announced in the *Journal* of the Indian Society for Agricultural Statistics, Vol. IX, No. 1, 1957. Additional information may be obtained from the Secretary of the Society,

c/o Indian Council of Agricultural Research
Statistical Wing, Library Avenue
Post Box No. 310
New Delhi 12, India

—Dr. B. V. Sukhatme
Indian Society for Agricultural Statistics

UNION OF SOUTH AFRICA

The **South African Statistical Association** was founded five years ago, and has now about sixty members. On October 31-November 1, 1958, the Association held its first Statistical Conference, at the University of the Witwatersrand, Johannesburg. Eighteen papers were read at the Conference, almost half of which were concerned (by title) with industrial applications, the remainder being devoted to various aspects of statistical methodology.

The program of the Conference was sent to THE AMERICAN STATISTICIAN by **Professor J. E. Kerrich,** of the University of the Witwatersrand, who has been President of the South African Statistical Association in 1957 and 1958. Professor Kerrich wrote further:

> "All of our eight Universities offer something in the way of courses in mathematical statistics. Four of them have departments of statistics, with full professors in charge. There is a small but steady flow of M.Sc.'s, and Ph.D.'s in Statistics, and at least two D.Sc.'s have been awarded.
>
> "Various large organisations such as the Transvaal and Orange Free State Chamber of Mines, the Iron and Steel Corporation, and Council for Scientific and Industrial Research, and African Explosives and Chemical Industries have established statistical units."

UNITED KINGDOM

At a Special Meeting of the **Royal Statistical Society** on December 3, 1958, there was a discussion of the Report of the Committee on the Supply of and Demand for Statisticians. The report, which will be published in the *Journal* of the Society, was prepared by a committee under the chairmanship of Professor E. S. Pearson.

The Royal Statistical Society has a very active **Industrial Applications Section,** with at least eight regional groups holding monthly meethings. It has been announced that copies of the papers presented at a Conference on Statistical Sampling in Industry (Birmingham, May 1958) can be purchased (price 3s. 6d.) from Mr. D. Goldberg, A.E.I. Lamp and Lighting Co., Ltd., Melton Road, Leicester.

The Society holds monthly Ordinary Meetings, some of which are designated Research Methods Meetings. The latter are meetings of the Research Section at which formal papers are read. A paper on "Geometric Distributions in the Theory of Queues" was read by Mr. C. B. Winsten on November 13, 1958.

There are also a General Applications Section (formerly called the Study Section) and a Medical Section.

YUGOSLAVIA

Mr. Donald C. Riley, Executive Director of the ASA, attended the biennial meeting of the Yugoslav Statistical Association at Sarajevo, September 18-21, 1958. Discussions during the sessions were concerned especially with population, national income, and regional problems.

The **Yugoslav Statistical Association** publishes a quarterly journal, *Statisticka Revija,* now in its ninth volume. The table of contents is published in English and French as well as in Serbo-Croatian. Each article and book review is followed by an abstract in English or French. Each issue contains a very extensive account of recent publications in all countries. For example, in May 1958 there were nine book reviews, seven pages of brief abstracts, a five-page list of new books, and a list of journals received from 16 countries and the UN, with complete table of contents in many cases.

IN DEFENSE OF THE RANDOM NUMBER

(Ed. Note: See Page 35, Oct. 1958 Issue of THE AMERICAN STATISTICIAN*)*

The random number's dignity
Consists in how he came to be,
And since the process has its laws
He really has a hidden cause,

But even in the sense abstract
His dignity is still a fact,
For he has logical ascendance
In his stochastic independence.

THOMAS F. MOSIMANN

FEDERAL STATISTICAL ACTIVITIES

Major Statistical Items in the 1960 Budget

Budget recommendations for the fiscal year ending June 30, 1960, presented to the Congress in January, include about $38.2 million for the current programs of the major Federal statistical agencies—an increase of $1.6 million over the amount provided for 1959. In addition, funds totalling $92.8 million are requested for periodic programs, principally the decennial censuses. The largest increase requested for current programs in 1960 is accounted for by proposals for improvement of construction statistics, responsibility for which would be consolidated in the Bureau of the Census under a new plan for rearrangement of responsibilities for construction and labor force statistics described elsewhere in this issue.

The 1960 recommendations for principal Federal statistical programs are summarized in Special Analysis I of the 1960 Budget Document by broad subject areas, as in previous years. The most important program changes recommended are, in brief:

Labor statistics: Two program increases are requested over the amounts provided for the Bureau of Labor Statistics in 1959: (1) $160,000 for estimates of labor requirements for specific types of construction activity; and (2) about $250,000 for converting monthly series on employment, hours and earnings, and industrial hazards to the revised Standard Industrial Classification.

Demographic statistics: The only increase requested for current programs in the broad area of demographic statistics is an item of nearly $100,000 for the Office of Education, in large part to provide additional mechanical tabulation facilities.

Prices and price indexes: An increase of more than $200,000 is requested for the Bureau of Labor Statistics to improve price reporting for the Consumer Price Index by increasing the frequency of price collection for important commodities subject to wide price fluctuations, expanding the pricing sample for selected items, and increasing the number of price quotations per city for items for which price variability is large.

Production and distribution statistics: No major program changes are contemplated in 1960, and the only increase requested is for about $100,000 to improve the accuracy and usability of foreign trade statistics compiled by the Bureau of the Census.

Construction and housing statistics: A net increase of $400,000 is requested for the integrated construction statistics program, under the new plan for centralization of responsibility mentioned above.

National income and business financial accounts: An increase of about $150,000 over the 1959 program is requested to enable the Office of Business Economics, Department of Commerce, to effect further improvement and extension of the national income accounts, and to complete the survey of foreign investment. The new funds would provide for developing product estimates in constant dollars by industry, and for expanding work on the estimation of purchases and sales by industry.

Periodic programs: The total of $92.8 million requested for periodic programs in 1960 includes the following items: processing and tabulation of 1958 censuses of business, manufactures, and mineral industries, $6 million: 18th Decennial Census (the major portion of the cost of which will be incurred in 1960), $86.5 million; and preparatory work on a consumer expenditure survey and other research necessary to appraise and revise the Consumer Price Index, $230,000.

Single copies of Special Analysis I of the 1960 Budget, on "Principal Federal Statistical Programs," may be obtained from the Publications Unit, Bureau of the Budget. Washington 25, D. C.

—Raymond T. Bowman,
Assistant Director for Statistical Standards,
Bureau of the Budget

Survey of Starting Salaries for Statisticians

In support of a request to the Civil Service Commission to establish increased starting salaries for Survey and Analytical Statisticians, at grades GS-5 and GS-7, (minimum starting salaries for Mathematical Statistician had already been raised) the Board of Civil Service Examiners of the Bureau of the Census conducted a wage survey in April 1958, to obtain information on starting salaries for two groups of new college graduates: (a) those who on their first job were employed as statisticians outside the Federal Service, and (b) those who met minimum Civil Service GS-5 requirements for statistician whether or not they were working as statisticians.

The survey was based on a one-sixth sample of all graduates who, in 1957, received a Bachelor's degree with a major in Economics. The sample was drawn from the Office of Education Circular #499—*Earned Degrees Conferred by Higher Educational Institutions*, using the listing of colleges granting degrees in Economics. The sampling was done in two stages, with schools sampled first with a weight proportional to the number of A.B. graduates in Economics. Graduates were sampled within schools so as to provide a self-weighting sample of 1 in 6. 1187 graduates were included in the sample and 949 questionnaires were returned, usable at least in part, as a result of the initial mail out and two follow-up letters.

The survey failed to produce the information it was primarily after because an insufficient number of graduates in the sample fell into either of the two groups. This is illuminating in itself. However, the study did uncover information having an important bearing on three aspects of the recruitment problem.

First, it was found that only a little more than half (53%) of the male graduates are available for employment. The others are either in the military service or pursuing graduate or professional studies.

The second and perhaps chief obstacle facing the Federal service in recruiting Analytical and Survey Statisticians is the relatively small number of graduates majoring in Economics who meet the minimum qualification requirements. These requirements are 15 semester hours of Mathematics and Statistics of which at least six semester hours are in Statistics. Only 10% of the sample met this requirement.

On the third issue—salary, the situation is more favorable. The median starting salary for the male graduates in the sample on their first job was $347 per month (±$5 per month). The recent general Federal pay raise has brought the GS-5 salary up to $337 per month. This pay raise coupled with the new authority to hire highly qualified bachelor degree graduates at the GS-7 level ($415 per month) have brought Federal salaries in line with comparable level positions outside the Federal service at these lower grades.

The results suggest that the Federal service might consider the establishment of trainee positions at the GS-5 grade which would be filled with majors from a variety of fields such as Economics, Business Administration, Agriculture, Sociology and other subject matter areas to which statistical methods are being applied. These trainees would be accepted with less than the present minimum educational requirements in mathematics and statistics. In order for these trainees to move up to a Statistician position GS-7, successful completion of a technical training program in Mathematics and Statistics would be required. Such a program may now be feasible in light of the broadened training authority recently granted Federal agencies.

—David L. Futransky
Secretary, Board of Civil Service Examiners
Bureau of the Census

Federal Grants-in-Aid for Education Statistics

A new program of Federal grants-in-aid for improvement of statistical services of State education agencies has been initiated by the U. S. Office of Education under provisions of the National Defense Education Act of 1958. Title X of the Act includes a section (Sec. 1009) authorizing appropriations for grants to the States to assist them "to improve and strengthen the adequacy and reliability of educational statistics provided by State and local reports and records and the methods and techniques for collecting and processing educational data and disseminating information about the condition and progress of education in the States." Each State may receive a maximum grant of $50,000 per year under the program, during a four-year period beginning with the fiscal year 1959. In order to be eligible for grants under the program, the State must have a plan for utilization of the funds approved by the U. S. Commissioner of Education. The Federal grants must be matched by State funds. Grants under the program may be utilized to undertake new programs or for expansion of existing programs.

The purposes of the Federal grants under this program, as specified by the Congress, include: "(1) improving the collection, analysis, and reporting of statistical data supplied by local educational units, (2) the development of accounting and reporting manuals to serve as guides for local educational units, (3) the conduct of conferences and training for personnel of local educational units and of periodic reviews and evaluation of the program for records and reports, (4) improving methods for obtaining, from other State agencies within the State, educational data not collected by the State educational agency, or (5) expediting the processing and reporting of statistical data through installation and operation of mechanical equipment."

James E. Gibbs, Jr., formerly Director of Administration and Finance, Tennessee State Department of Education, has been appointed by the U. S. Office of Education to administer the program; and Allen R. Lichtenberger, Nebraska State Research Director, has been appointed as consultant for the program.

—Israel Rubin
Office of Statistical Standards
Bureau of the Budget

New Arrangements for Labor Force Statistics

As described in Special Analysis I of the 1960 Budget Document, the Bureau of the Budget has arranged with the Secretary of Commerce and the Secretary of Labor for a reallocation of some of their statistical responsibilities. On the one hand, responsibility for all phases of construction activity statistics will be consolidated in the Department of Commerce (a later article will describe this program). The other aspect of the new arrangement is the transfer of responsibility to the Department of Labor for the labor force statistics derived from the *Current Population Survey*.

For nearly two decades, the Bureau of the Census has been publishing estimates of the labor force, employment and unemployment as developed from the *Current Population Survey*, a monthly interview survey of a scientifically-selected sample of households. Beginning in July 1959, if the necessary budgetary changes are approved by the Congress, the Bureau of Labor Statistics in the Department of Labor will have the responsibility for the Monthly Report on the Labor Force—for planning and analyzing labor force aspects of the *Current Population Survey* and publishing the results. The Census Bureau will continue to maintain the basic sample and will collect and compile the data on labor force as an agent of the Bureau of Labor Statistics.

The labor force information developed from the *Cur-*

rent Population Survey is of great public interest because it is the only source for overall estimates of total employment and total unemployment. It is also the only current source from which information is available on the demographic characteristics (age, sex, marital status, color) of persons at work, those looking for work and those not in the labor force; on the reasons for working part-time; on the number of workers by broad occupational groups; and on similar types of information obtainable by direct sample enumeration of the population.

At the same time, the Bureau of Labor Statistics has been preparing monthly estimates of employment, hours and earnings, based on establishment payroll reports, for industries other than agriculture, and publishing this type of data for a wide range of detailed industries and areas. Also in the Department of Labor, the Bureau of Employment Security compiles a weekly count of new claims for unemployment insurance and of insured unemployment among the two-thirds of the working population covered by unemployment insurance programs.

These three series reflect the same underlying economic situation yet measure different aspects of the labor market. It is therefore expected that because the series report important but somewhat different aspects of employment and unemployment the numbers will not move identically from month to month. Some differences may also arise because of sampling variability and response or reporting errors. A joint release of the monthly data by the Secretaries of Commerce and of Labor was initiated in 1954, in order to provide a rounded picture of the employment situation based on all of the available information and to promote a better understanding of the different types of data and of differences which may arise from time to time among the various series.

It is expected that the new move will promote still better understanding and use of the different types of data by encouraging more exploratory work on the nature of the differences; by developing additional analytical studies of the labor market and factors affecting it; and, as time goes on, by further development of labor force data and their application to current policy issues in which such information is of inestimable value.

At the same time, it should be made clear that responsibility for other aspects of the *Current Population Survey* has not been affected. The Bureau of the Census remains responsible for the design of the sample, the conduct of the enumeration and the planning and publication of information other than that on the labor force, employment and unemployment. For example, information now collected at least once a year on migration, income and school attendance will remain the responsibility of the Census Bureau. Also unaffected is the program of demographic statistics now the responsibility of the Census Bureau. The Bureau will continue to prepare and publish estimates and projections of the population according to various characteristics, as in the past, some of which draw on information developed through the *Current Population Survey*. The *Survey* will also continue to be the vehicle through which other agencies, public and private, occasionally obtain information on subjects of interest by the payment of the additional costs for supplementary questions.

—Raymond T. Bowman
Assistant Director for
Statistical Standards
Bureau of the Budget

Among Recent Publications—

Supplement to 1957 Edition, Standard Industrial Classification Manual, issued by the Office of Statistical Standards, Bureau of the Budget. Embodies the results of a year's experience in applying the 1957 *Standard Industrial Classification Manual*, and contains (1) corrections in titles, definitions, and index items; (2) coding interpretations; and (3) additional index items. Available at 15¢ a copy from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Frequency of Change in Wholesale Prices—A Study of Price Flexibility (BLS Report No. 142), issued by U. S. Bureau of Labor Statistics. Reports results of a study of the frequency and amplitude of price changes for approximately 1,800 wholesale price index series for the period 1947-56. Available from the Division of Prices and Cost of Living, Bureau of Labor Statistics, Washington 25, D. C.

Occupational Trends in the United States: 1900 to 1950, by David L. Kaplan and M. Claire Casey, issued by the Bureau of the Census as Working Paper No. 5. Presents Census data on the economically active civilian population, showing distribution by occupation group, by sex, and other occupational characteristics. Available at 20¢ a copy from the Bureau of the Census, Washington 25, D. C., or from field offices of the Department of Commerce.

Illustrative Projections of the Population of the United States, by Age and Sex: 1960 to 1980 (Current Population Reports, Series P-25, No. 187), issued by the U. S. Bureau of the Census. Presents four series of projections indicating the future level and age-sex composition of the population under certain assumptions as to fertility, mortality and net immigration. Includes detailed description of the methods and assumptions used. Available at 25¢ per copy from the Bureau of the Census, Washington 25, D. C.

Concepts and Definitions in the Health Household-Interview Survey (Public Health Service Publication No. 584-A3), issued by the U. S. Public Health Service as a National Health Survey publication. Describes concepts of morbidity, disability, and medical and dental care;

(Continued on Page 23)

QUESTIONS AND ANSWERS

Edited by ERNEST RUBIN
U. S. Department of Commerce
and American University

Aspects of Soviet Census and Population

After a lapse of twenty years the Soviet Union began a census of population on January 15, 1959 which was completed on January 22nd. This undertaking is a major statistical operation and the results of this census will be of great importance throughout the world. For these reasons two discussions have been prepared dealing with problems of Soviet census enumeration and population statistics which will provide useful background information.

The reader should keep in mind that population losses sustained by the U.S.S.R. during World War II, changes in its area since 1945, limitations of the 1939 census and defects in the annual reporting of births and deaths made it difficult to estimate accurately the postwar population of the Soviet Union. Certain problems of census taking are universal but each country experiences special difficulties connected with its culture, politics, economics or geography. Several years ago one of my graduate students explained to me that in India the tiger often affected the results of a census—by eating the enumerator. I wish to thank Doctors Selegen and Petrov for discussing problems of Soviet census taking and Mr. James Brackett for his examination of existing Soviet population statistics.

SOVIET PEOPLE versus POPULATION CENSUS by Galina V. Selegen and Victor P. Petrov

It should be noted that usually the census interview is a double-sided operation in which the skill of an enumerator encounters the preparedness of a respondent to answer the questions in a proper way and without any prejudice. Unfortunately, it is not always the case even in the advanced countries; some of the respondents might fail to give a correct answer, some others might give way to apprehension and suspicion. For this reason the preparatory stage of a census pays considerable attention to its publicity, aimed at the training of the citizens in census program and in tasks of the census.

The enlistment of the population and public institutions for the support of a census was at all times, and still is, one of the most acute problems of the Soviet censuses. In the early twenties, and also in 1926, special legislative directives were required in order to enforce the agencies concerned to spring to action and to provide the census officials with the necessary paper supplies, means of transportation, and premises in which to locate the field offices and to keep the census materials. But still much greater efforts were to be provided for enlistment of cooperation of reluctant Soviet citizens.

The publicity associated with preparation for the 1920 and 1926 censuses had given a considerable space to the development of skill and desire of the respondents in giving correct and uniform responses. This was not an easy task considering the relatively low educational level of the Soviet citizens at that time. Considerably more complicated was the problem of overcoming the distrust and suspicion which the newly inaugurated censuses aroused among Soviet citizens.

The reports received on the first census of 1920 indicated generally unfriendly and even hostile attitude of some groups of Soviet citizens toward the census. There were acts of violence recorded against the census-takers, as well as destruction of the census materials, and various other aggressive acts against the census.

The entire authority of omnipotent Lenin, coupled with his threats of political reprisals to those opposing the census (1) were placed on the scale in order to overcome and subdue the hostile attitude of the population. Despite all these measures the 1920 census had resulted in the loss of lives of 33 enumerators, murdered by those they were trying to interview. In addition scores of others were beaten or badly injured during the enumeration. (2)

One may say that political conditions and overall position of the country in 1920 was hardly favorable for the conduct of a census; the country was divided by hatred and distrust soon after the collapse of the old regime. The whole country was in turmoil; people moved across the face of the country aimlessly, and the entire transportation system was either destroyed or badly damaged. The next census of 1926 was expected to be met with much greater confidence of the population, especially as the country became pacified, and political conditions stabilized. Various sources observing the census procedure reported, however, that the attitude of the respondents was most suspicious. The respondents observed in some areas refused to answer the questions at all.

A special correspondent of *Izvestia*, an official Government newspaper, reported from Piatigorsk (Caucasus) and from Rostov-on-Don, that about ten percent of householders refused to give the required information on the first day of the preliminary survey before the actual enumeration. The same report complained that rumors were circulated among the peasants that the census was conducted for the cause of Antichrist, while the others claimed that it was aimed at the increase of taxation burden. (3)

The "sore" question of the census schedule was that on living space. The Report on Leningrad enumeration noted the attempts of respondents to underestimate the size of the living space or to ascribe a part of it to a neighbor. The reason for this was a fear that the surplus or extra space (if such thing was possible in overcrowded Leningrad) would be taken from them, as a result of census information. (4) Although the murders, beatings, and other acts of violence against the census-takers had disappeared from the reports of the 1926 census, nevertheless the resistance of the population to the census had not ceased, assuming, perhaps, considerably milder forms of a furtive character.

One of the ways to fight resistance and to reduce distrust and suspicion was to include special clauses in the early census directive, promising to treat the information received by the census takers as *confidential.* At the same time these clauses were supplemented by the others, placing responsibility on those who were found to be giving false information. Sometimes these clauses were reinforced, as was the case with the 1920 census, by the threats of reprisals and court indictments. (5)

Such extreme emergency measures, as reprisals and court indictments, resulting from the unstable political conditions during the civil war and soon after it, were naturally expected to disappear with the succeeding censuses. This, however, was not so. The 1939 census not only made use of punitive measures for "unconscientious" respondents, but extended similar measures on enumerators as well on those, to be exact, who were to be found "guilty in divulging p e r s o n a l information collected in the census". (6)

The publicity for the forthcoming 1939 census, accordingly was given a new task, i.e. the census propaganda was to concentrate heavily on apprehensions, that the census might be harmed and distorted by "enemies of people". This task was in addition to the usual educational tasks of training the population in census technique, as well as in understanding the census program.

> "One should know", said *Izvestia,* "that the masked enemy may try to arouse distrust for the census. It is necessary to watch closely for their hostile machinations while this mass political work is conducted." (7)

The fear and apprehension of a possibility of sabotage of the census has been many times expressed in other articles, quite often taking the appearance of a sheer *idée fixe.*

> "The remaining Trotskyist-Bukharinist elements may try to harm the census, appearing in the role of subversive agitators, by spreading rumors, distorting the rules and misinterpreting the purposes of the census." (8)

The fear of resistance to the census on the part of the Soviet population and the call to fight it by all means is frequently found in the pre-census press:

> "All attempts to resist the census should be nipped in the bud." (9)

The theme of "fighting resistance" is a predominant motive of the 1939 census publicity, while that of "fighting superstition and illiteracy" was dominant during the preceding censuses. The solution of this problem, they said, was in an absolute cooperation of the Soviet citizens in a purely Bolshevist way. All citizens were invited,

> "to watch sharply for the hostile machinations at the time of census. The duty of every Soviet citizen is to help the census." (10)

Soviet citizens were invited to denounce cases, where someone was found failing to supply proper information to the census takers. They were also requested to watch enumerators, whose behavior aroused suspicion. This last measure was designed:

> "to prevent appearance, in the role of enumerators, of some impostors, coming from the ranks of remaining criminals still at large." (11)

The reports on the completed 1939 census have repeatedly accentuated the friendly attitude and extreme cooperation of Soviet citizens. And no wonder. It was hardly possible to expect any other report, since any error or failure to answer the question might have been interpreted as a hostile attitude or even an attack of the "enemy of the people".

It is hoped that the times have changed somewhat in twenty years, especially since the death of the old dictator, and that the 1959 census will be conducted in a more normal manner.

NOTES

1. I. Pisarev, "Dve Perepisi" *Izvestia,* Jan. 17, 1939.
2. P. I. Pustokhod i. V. K. Voblyi, *Perepici Naseleniia,* Moscow, 1936.
3. "Vragi", *Izvestia,* Dec. 16, 1926.
4. *Pravda,* Dec. 17, 1926.
5. Decree for the conduct of the 1920 census, Apr. 20, 1920, *Vestnik Statistiki,* TsSu RSFSR, No. 1-4, 1920, pp. 193-194.
6. "O vsesoyuznoi perepisi naselenia 1939 goda", July 26, 1938, *Izvestia,* July 27, 1938.
7. "Otlichno podgotovit' i provesti perepis' naselenia", *Izvestia,* Oct. 3, 1938.
8. O. Bozin "Vsenarodnoe delo", *Izvestia,* Sept. 6, 1938.
9. *Ibid.*
10. "Otlichno podgotobit' . . .", *Izvestia,* op. cit.
11. *Ibid.*

POPULATION DYNAMICS IN THE U.S.S.R. by James W. Brackett

From the volume of data on the U.S.S.R. now flowing into this country one would suspect that this is the era of the renaissance of Soviet statistics. Whereas, a few short years ago, students of the Soviet Union were obliged to work with fragments, they are today confronted by relatively large masses of data which unfortunately do not always seem to hang together. Often, hard choices must be made and official figures must be treated gingerly and with reserve. The rule of *caveat emptor* applies as much today as it ever did, although the stock of goods open to choice is somewhat larger and more varied. We need to be conscious of the limitations of the data.

It is rather easy to take a selection of figures from Soviet sources, and by emphasizing different features, convey radically different impressions. Thus, a few months ago, an American news magazine asserted that the United States is growing more rapidly than the Soviet Union, because during the past 15 years the population of this country had increased by 35 million while the increase in the U.S.S.R. was only 10 million. As these observations were being presented to the American public, Ivan Ivanovich in Moscow could read in a leading Soviet journal that "the level of mortality in the U.S.S.R. is lower, and the natural increase higher than in the United States . . . and other capitalist countries." The data on which these two views are based are not necessarily irreconcilable, but the views themselves appear to be. The trouble lies partly in the fact that, despite recent improvements, there still remain important gaps in demographic knowledge, partly in the lack of information by which the reliability of most figures may be evaluated, and partly in the polemic context in which comparisons between the two countries are so frequently presented. A close look at the data seems warranted.

On June 22, 1941, when the Soviet Union became a belligerent in the Second World War, about 200 million people are believed to have resided within the present territory of the U.S.S.R. (1) This figure is the sum of the officially reported population within the 1940 territory of the U.S.S.R., except that later retroceded to Poland, estimates of the population of territories acquired later, and an allowance for natural increase up to mid-1941. Calculations prepared in the Foreign Manpower Research Office, Bureau of the Census, primarily by working backward from postwar and current official Soviet statistics, indicate that the population may have declined to a low of perhaps 175 million in 1947. While the scarcity of reliable data precludes a precise calculation of population change during the period, it is possible to make very rough estimates of births, deaths, and migration. Thus, between 1941 and 1947 there may have been as many as 50 million deaths—30 million more than would be expected had the prewar level of mortality continued; 27 million births, or about three-fourths of the number expected from a continuation of the prewar birth rates, and a net outmigration of about three million. (2)

During 1948 and 1949, however, there was apparently a modest recovery; according to Soviet data the population at the beginning of 1950 had reached 180 million. An annual growth rate of 1.7 percent for the period 1950-1956 brought the population to its prewar level of 200 million during the first quarter of 1956. (3)

The official data upon which this calculation is based, however, particularly the official population estimate of 200.2 million for April 1956, are open to some criticism. The implication that as many as 50 million persons died between 1941 and 1947 seemed too unreasonable to accept. The fact that before mid-1956, when this figure was released, Soviet statisticians used population estimates as high as 220 million to calculate per capita production reinforced the skepticism. An examination of Soviet voter statistics and school enrollment data, however, suggest that while the population probably is several million higher than the current reports, the official estimate remains within the realm of possibility. In addition, following 1956, Soviet statisticians began using population estimates consistent with the official data.

During the period 1950 to 1956, the postwar years for which Soviet vital statistics have been published, there was an annual average of 26 births and 9 deaths per 1,000 population in the Soviet Union (4) compared to U.S. birth and death rates of 25 and 9.5, respectively. (5) The Soviet birth rate since 1950 has generally been higher and the death rate lower than comparable U.S. rates.

Crude vital rates, however, are not good measures of fertility and mortality, especially when comparisons are being made between two countries with markedly different age structures. The Soviet gross reproduction rate since 1950 has remained relatively stable, averaging about 140 for the period. (6) The U.S. gross reproduction rate, which was about 7 percent higher than the Soviet rate in 1950, has risen steadily throughout the period. In 1956, the last year for which birth data are available for the Soviet Union, the U.S. gross reproduction rate was about 30 percent above the Soviet rate. (7)

At least during the past 60 years, Russian fertility has shown the same downward trend experienced by most Western countries. The gross reproduction rate for the whole country in the 1890's was probably near Lorimer's estimate of 329 for the European Part. By the mid-1920's Lorimer estimates that the gross reproduction rate for the interwar territory had declined to 264 and that by 1938 it was only 219. (8) In 1940 the gross reproduction rate for the present territory was probably about 180. (9)

Although available information is insufficient for a complete understanding of the Soviet fertility pattern, I should

like to list several conditions which may be important in explaining, at least in part, the decline in fertility.

The rapid urbanization of the country is undoubtedly of primary importance. At the time of the Russian revolution, only about one-sixth of the population was urban. Today the country is about 45 percent urban. (10) While there are no recent vital statistics for the urban and rural part of the country as a whole, the data available for a few local areas leave little doubt that urban fertility is well below rural. Consider for example the crude birth rates for the city of Leningrad and for Leningrad oblast, a contiguous, considerably rural, nearby territory. The 1955 birth rate in the city was only 15.2, (11) as compared with 25.2 in the oblast. (12) Similarily, in Novosibirsk the birth rate was 24.5 as compared with 33.5 in the oblast. (13) In Alma Ata it was 24.5 against 34.7 in the oblast. (14) We also have figures for the Moldavian SSR, in which the urban birth rate was 24 as opposed to a rural rate of 32. (15) In each of these cases the urban birth rate was from 60 to 80 percent of the rural rate. The same pattern is evident in data for 1940, although at that time the data available suggest that the margin of difference between urban and rural birth rates was somewhat smaller than in 1955. Moreover, the urban population has increased far more rapidly than the rural, so that even if the birth rates by urban and rural residence had remained unchanged, the national birth rate would have declined.

No doubt the very tight urban housing situation, the enforced crowding of several families into tiny dwelling spaces, the sizable number of adults living in dormitories, the pent-up demand for consumer goods, and other irritants characteristic of urban life in the U.S.S.R. have had an effect on fertility too, but one need not rely too much on such factors to explain the lower urban fertility. A more direct connection may be seen in terms of the high female labor force participation rates prevailing in the U.S.S.R. In 1956, women comprised at least 45 percent of the employed working force outside collective farms, (16) and probably an even higher proportion within them. It is true that there are maternity leave policies, day nurseries, and other beneficial arrangements for working women who bear children. But these are clearly inadequate, and, without here going into detail, it will suffice to say that they probably have little effect on the birth rate. (17) The important point is, that despite ameliorative efforts, working women tend to have restricted fertility.

Still another factor contributing to a depressed birth rate in the recent past is a war-caused shortage of males of suitable age. According to estimates prepared by the Foreign Manpower Research Office, there were only 78 males per 100 females aged 20 to 44 years in 1950, and 85 in 1956. Whatever effect the imbalance of the sexes may have had on fertility is largely a matter of history now, for the imbalance is rapidly being wiped out. By 1966 it will be gone entirely.

It is unfortunate that the only data on fertility so far announced are given without the detail by age of mother and other variables which might permit a more sophisticated analysis of fertility trends. The figures that are available do fill in the relatively bleak picture to some extent, and we should be grateful for that. However, because the figures appear as rates, we must be guarded in accepting them at face value, first because the population base used is probably too small, and second because the degree of completeness of registration and of geographic differentials in completeness of registration is unknown. (18) So much for fertility.

Evaluation of Soviet mortality figures is also a problem. Consider, for example, available information on the expectation of life at birth. In 1955-1956 life expectancy was officially reported to be 67 years in the Soviet Union (19) and 69.5 years in the U.S. (20) The U.S.S.R. claims mortality has been declining at an unusually rapid pace. Expectation of life has been specifically reported for 1954-1955 at 64 years. (21) From reported infant mortality and crude death rates, (22) it is possible to establish rough orders of magnitude of 45 to 50 years in 1940, and 60 years in 1950. Since mortality during the war and early postwar period was exceptionally high, it seems likely that life expectancy in 1947 or 1948 was not above the 1940 level. Thus, Soviet life expectancy appears to have jumped by 10 to 15 years in a period of 2 to 3 calendar years between 1947-1948 and 1950, increased more slowly over the next four years, and then spurted ahead by an increment of three years between 1954-1955 and 1955-1956.

The implication that in only eight years the Soviet Union was able to bring about improvements in its mortality that required a half century in the United States casts doubt on the Soviet data. In addition to the usual errors in the registration of vital events, the Soviet life tables for ages 5 years and over are based on very crude population estimates (23) which, in the absence of a census since 1939, are derived from a series of registers kept primarily for other purposes. These registers admittedly contain many errors.

But the possibility that the decline in Soviet mortality may be real cannot be completely rejected. Similar declines have been reported by other countries since the war. In Ceylon, for example, about 10 years was added to life expectancy in only 3 calendar years, (24) while Japan's expectation increased from 57.5 years to almost 63 years between 1948 and 1951. (25) In both of these countries, as in the Soviet Union, there was a period of very rapid decline in mortality followed by a period of less rapid decline and, at least in the case of the Soviet Union, a second period of rapid decline at the end of the period is indicated by the figures made available.

An interesting comparison may be made between the U.S.S.R. and Japan. In 1926 life expectancy in the European part of the U.S.S.R, an area containing roughly 80 percent of the population within the 1926 territory, was officially reported to be 44 years. (26) Since the noncovered part of the country contains only about 20 percent of the total population, life expectancy in the entire 1926 area cannot be greatly different from that for the European part. Japanese life expectancy was probably at about the same level in 1926, although judging from the infant death rate, it may have been somewhat higher. Between 1926 and 1940 mortality in the U.S.S.R. does not appear to have been greatly improved from that observed for 1926. For example, the infant mortality rate, again for the European part, was 187 in 1926-1927. (27) An infant mortality rate of 184 has recently been reported for 1940, (28) presumably for the current territory. Japanese mortality, however, appears to have experienced considerable improvement. There, the infant mortality rate for 1940 was only 90.4, (29) or about one-half the rate of the U.S.S.R.

During the postwar period, mortality in the two countries probably has been at about the same level, although Japan seems to have recovered from the war more rapidly, and to have maintained a slight lead. Life expectancy must have been near 60 years in both countries by about 1950, and 64 years by 1954. (30) Japan's infant mortality rate of 40.7 for 1956 is about 13 percent below the Soviet Union's rate of 47. (31)

The official crude death rate of the U.S.S.R. for 1956 was apparently 7.5 per 1,000 population. (32) This represents a considerable improvement since 1940, when the death rate was 18.3. (33) Thus, in 16 years, according to official data, the crude death rate has been reduced by 59 percent. In the United States the death rate was cut by 13 percent during the same period. The usual doubts about the completeness of vital registration in the U.S.S.R. preclude a full acceptance of the Soviet data.

It is true, of course, that the relatively low Soviet crude death rate is in part a reflection of a relatively youthful population. United States age- and sex-specific death rates for 1955 applied to the estimated 1956 population of the U.S.S.R., by age and sex, yield a crude death rate of 6.3. The Soviet crude death rate for 1956 was about 15 percent higher. Yet the small margin of superiority of the United States mortality rates over those of the U.S.S.R. is disturbing because our knowledge of their medical and sanitary progress—limited as it is—would hardly support the inference that mortality rates for the two countries would be so close together. Recent visitors to the U.S.S.R., who have been concerned with public health, indicate that the level of sanitation and medical care in rural Russia leaves much to be desired. (34) And the rural U.S.S.R. still has about 55 percent of the country's population. (35) Moreover, the infant death rate, according to Soviet claims, is about half again as large as in the United States. Again, consider the death rate from tuberculosis, 46.3 per 100,000 population as reported in 1957. (36) This was more than 5 times as great as the United States rate for 1955. (37)

A reliable prognosis on the dynamics of the U.S.S.R.'s population is, of course, uncertain. While it seems reasonable to expect a continuation of the downward trend in mortality, although probably at a somewhat slower rate, the future course of fertility is not clear. Soviet planners continue to promise more investment in consumers' goods —including housing. They talk also of more ample space in nurseries to accommodate the offspring of working women.

On the other hand, the prospects of a sizeable retirement of women from the labor force seem remote. As the low birth cohorts of the 1940's move into the working ages during the next several years, the supply of Soviet manpower will be tight. The net increase in the population of working age between 1956 and 1961 is expected to be only about 5 million compared to 12 or 13 million during the previous 5-year period (38)—and this during a period when the Soviet Union is committed to continued increases in production and a shortening of the work week.

But even if these conditions are eased considerably, there may not be an immediate rise in the birth rate. The Soviet Union, through its policy of universal education, has created what a few years ago in the U.S. might have been termed a "middle class attitude." This has come about at a time when the knowledge—and apparently the mechanical devices (39)—of contraception appear to be widespread, at least in urban areas. In addition, the liberalization of the abortion laws at the beginning of 1956, making abortion no longer a criminal offense (40) may tend to depress fertility. Consequently, alleviation of the above conditions may reinforce this "middle class attitude," and bring about a further decline in fertility, at least in the short run.

There is ample evidence in contemporary Soviet commentary that the statistical system of the U.S.S.R. is at this time producing data of poor quality, and that the areas of needed improvement are well known to Soviet statisticians. But, poor as the data may be, they are all there are, and they are being used regularly for planning, for operation of the economy, and for propaganda. We may accept them as the best official information that can be had, but we need not necessarily take them at face value.

NOTES

1. According to the census of January 17, 1939, 170.6 million people resided within the interwar territory. (See *Narodnoye khozyaystvo SSSR v 1956 godu (The National Economy of the U.S.S.R in 1956*, Moscow, 1957, p. 17.) The population of the territories acquired between 1939 and 1945 (less the population residing in the territory receded to Poland in 1945) numbered

about 23 million at the end of 1939. An allowance of 6 to 7 million for natural increase between the census of 1939 and mid-1941 yields a population of about 200 million. The official estimate of 191.7 million for 1940 reported in *Narodnoye khozyaystvo SSSR . . . loc.cit.*, was derived by adding to the 1939 census total an estimate of the population in the territory acquired in 1939 and 1940 (but excluding the territory returned to Poland in 1945) *without an allowance for natural increase.*

2. Births for the period 1941-1949 may be derived from school enrollment data reported in *Kul'turnoye stroitel'stvo SSSR (Cultural Construction of the U.S.S.R.)*. Frank Lorimer and John V. Graumen, in a table appearing in an appendix to (but published separately from) the book, *Soviet Economic Growth*, have prepared estimates of migrants. Deaths in the above calculation were derived as a residual and consequently reflect any errors in the other components.

3. *Narodnoye khozyaystvo SSSR . . .* op.cit., pp. 17 and 269.

4. *Ibid.*, p. 269.

5. U. S. Bureau of the Census, *Statistical Abstract of the United States, 1957* (Seventy-eighth edition). Washington, D. C. 1957, p. 56.

6. Estimates of the gross reproduction rate for the U.S.S.R. were prepared from births derived from officially reported birth rates and total population estimates consistent with official reports. Estimates of the female population by age used in the calculation were prepared in the Foreign Manpower Research Office, Bureau of the Census. Consequently, the gross reproduction rate contains an unknown error.

7. *Statistical abstract . . . op.cit.*, p. 61.

8. Frank Lorimer, *The Population of the U.S.S.R.: History and Prospects*, Geneva, 1946, p. 131.

9. See note 6.

10. *Narodnoye khozyaystvo SSSR . . . op.cit.*, p. 17

11. *Narodnoye khozyaystvo goroda Leningrada (The Economy of the City of Leningrad)*, Moscow, 1957, p. 141.

12. *Narodnoye khozyaystvo Leningradskoy oblasti (The Economy of Leningrad Oblast)*, Moscow, 1957, p. 131.

13. *Narodnoye khozyaystvo Novosibirskoy oblasti i goroda Novosibirska (The Economy of Novosibirsk Oblast and Novosibirsk City)*, Novosibirsk, 1957, p. 183.

14. *Narodnoye khozyaystvo Kazakhskoy SSR (The Economy of the Kazakh SSR.)*

15. *Narodnoye khozyaystvo Moldavskoy SSR (The Economy of the Moldavian SSR)*, Kishinev, 1957, p. 181.

16. *Narodnoye khozyaystvo SSSR . . .*, p. 206.

17. There are numerous stories in such Soviet publications as *Rabotnitsa* of women who are replaced or downgraded while on maternity leave and of long waiting lists (often three years or more) to enter a child in a day nursery. These stories appear quite frequently and are normally accompanied by editorial comment suggesting that they are representative of the general situation.

In addition, the usual 112 days of maternity leave, even when granted in full, may not be sufficient for the many Soviet women who do heavy labor.

18. Soviet statisticians occasionally admit underregistration of vital events but have not indicated, quantitatively, the degree. See, for example, A. Ya Boyarskiy and P. P. Shusherin, *Demograficheskaya statistika (Demographic Statistics)*, Moscow, 1955, p. 224.

19. *Dostizheniya sovetskoy vlasti za 40 let v tsifrakh (The Accomplishments of the Soviet Regime Over 40 Years, in Figures)*, Moscow, 1957, p. 345.

20. *Statistical Abstract . . . 1957*, p. 60.

21. *Narodnoye khozyaystvo SSSR . . .*, p. 270.

22. Infant mortality rates have been specifically reported *(Pravda*, February 18, 1958) as follows:

Year	Rate
1940	184
1956	47
1957	45

From a statement by Beria (*Pravda*, November 7, 1951) that "the mortality rate . . . has been halved in comparison to . . . 1940 and infant mortality has declined still further," it is possible to establish an infant mortality rate of about 90 for 1950. Crude death rates for these years are published in *Narodnoye khozyaystvo SSSR . . .*, p. 269.

23. A. Vostrikova, "Ob ischislenii . . . zhizni" ("On the Computation of the Average Life Expectancy Index"), *Vestnik statistiki*, no. 2, 1958, pp. 32-41.

24. United Nations, *Statistical Yearbook 1954*, p. 50.

25. *Ibid.*

26. Lorimer, *op.cit.*, p. 117.

27. *Ibid.*, p. 115.

28. *Pravda*, February 18, 1958.

29. United Nations, *Demographic Yearbook 1951*, p. 333.

30. For Japanese life expectancy, see United Nations, *Statistical Yearbook 1956*, p. 48.

31. United Nations, *Population and Vital Statistics Reports for January 1, 1958*, Statistical Papers, series A, vol. X, no. 1, p. 17; and *Pravda*, February 18, 1958.

32. *Dostizheniya sovetskoy vlasti za 40 let v tsifrakh*, p. 344.

33. *Narodnoye khozyaystvo SSSR . . . op. cit.*, p. 269.

34. The National Institutes of Health have prepared a bibliography entitled "Medical Research in the Soviet Union: Recent Reports from Western Sources, A Selected and Annotated List of References," compiled by Elizabeth Koenig. Several of these sources cover reports by various westerners to the U.S.S.R. In addition, see a note by Dr. Michael Shimkin published in *Science*, June 13, 1958, and Mark G. Field, *Doctor and Patient in Soviet Russia*, Harvard University Press, Cambridge: 1957.

35. *Narodnoye khozyaystvo SSSR . . . op. cit.*, p. 17.

36. *New York Times*, February 8, 1957.

37. U. S. Department of Health, Education, and Welfare, *Vital Statistics of the United States 1955*, v. 1, p. XCII.

38. U. S. Bureau of the Census, *Estimates and Projections of the Population of the U.S.S.R., by Age and Sex: 1950 to 1976*, by A. A. Campbell and J. W. Brackett, International Population Reports, Series P-95, no. 52 (forthcoming).

39. Evidence received after this paper was completed indicates growing interest in the subject of family planning. See, for example, "Family Planning in the U.S.S.R.", *Science*, May 16, 1958.

40. *Ibid.*

ON SIMPLIFIED COMPUTATIONS by *LaMont C. Cole, Cornell University*

The article by Dwyer on computational formulas for t^2 in the June, 1958 *American Statistician* brought to mind my experience during World War II when I had the problem of having large numbers of varied statistical computations performed by inexperienced personnel. The problem was solved by adopting a schedule of procedure that reduced many of the computations to simple routine. It was found possible to train persons to use a desk calculator and have them accurately computing regression equations and correlation coefficients after less than a day of practice. Since that time, 15 years of experience with students learning statistical computations has convinced me of the value of this routine.

The basic item in this procedure is none other than the "L" statistic employed by Dwyer and which we may define as:

$$L_{xy} = n\Sigma xy - \Sigma x \Sigma y$$

where x and y are paired values of two variables. By convention we write L_x for $L_{xx} = n\Sigma x^2 - (\Sigma x)^2$. When x represents an independent variable taking integral values, 1, 2 . . . , n, this statistic reduces to:

$$L_x = \frac{n^4 - n^2}{12}.$$

These L-statistics are gratifyingly easy to compute in a single step from the appropriate sums now that desk calculators are universally adapted for "reverse multiplication" and, as noted by Dwyer, the control over "rounding-off" errors is most gratifying.

At the time when I adopted this routine we were particularly concerned with the product-moment coefficient of correlation given by the formula:

$$r = \frac{L_{xy}}{\sqrt{L_x L_y}},$$

but the routine proved to be adaptable to many other computations.

For fitting the line $y = a + bx$ by means of least squares we have:

$$b = \frac{L_{xy}}{L_x} \text{ and}$$

$$a = \frac{\Sigma x^2 \Sigma y - \Sigma x \Sigma xy}{L_x},$$

where the numerator is another one-step computation on the desk calculator.

The "residual variance" or squared "standard error of estimate" is:

$$\overline{S}^2_y = \frac{L_x L_y - L^2_{xy}}{n(n-2)L_x}$$

For the multiple regression formula $y = a + bx + cz$, we have:

$$c = \frac{L_x L_{yz} - L_{xy} L_{xz}}{L_x L_z - L^2_{xz}},$$

$$b = \frac{L_z L_{xy} - L_{xz} L_{yz}}{L_x L_z - L^2_{xz}}, \text{ and}$$

$$a = \frac{\Sigma y - b\Sigma y - c\Sigma z}{n}.$$

In this last formula we accept the risk of rounding errors for the sake of a brief formulation.

For fitting the second degree parabola $y = a + bx + cx^2$ we simply employ the above formulas replacing z by x^2. The same types of computations could readily be extended to the fitting of higher order polynominals and multiple regression equations involving more than 2 independent variables except for the fact that the numbers get so large that they overflow a 10-column desk calculator.

Coefficients of partial correlation are also readily computed from:

$$r_{xy.z} = \frac{L_z L_{xy} - L_{xz} L_{yz}}{\sqrt{(L_x L_z - L^2_{yz})(L_y L_z - L^2_{xz})}}.$$

Thus, these "L-statistics" lend themselves to a wide variety of computation in addition to their basic uses in significance tests. For a series of n values, X_i, the "sum of squares within" the category X is simply L_x/n, the variance is $s^2_x = L_x/n(n-1)$, the coefficient of variation is

$$\frac{100}{\Sigma x}\sqrt{\frac{nL_x}{n-1}},$$

and the standard error of $\overline{X}$ is:

$$s_x = \sqrt{\frac{L_x}{n^2(n-1)}}.$$

From this last formula one comes easily to Dwyer's formulas (9) and (11) for t^2.

In our experience we have found it most convenient to test the null hypothesis, $\mu_x = \mu_y$, by means of the formula:

$$t = (n_y\Sigma x - n_x\Sigma y)\sqrt{\frac{n_x + n_y - 2}{(n_y L_x + n_x L_y)(n_x + n_y)}},$$

which, when the groups are of equal size, $n_x = n_y = n$, reduces to:

$$t = (\Sigma x - \Sigma y)\sqrt{\frac{n-1}{L_x + L_y}}.$$

If the two series are correlated, the appropriate correction of the t value can be made simply by subtracting $2L_{xy}$ from the denominator under the radical sign.

A NOTE ON THE COMPUTATION OF χ^2 by *Mary G. Natrella, National Bureau of Standards*

There is a useful, but not widely-known short cut available for computing χ^2 for the comparison of two observed frequency distributions with equal total counts. The advantages are that it does not require computing the expected frequencies, avoids problems of rounding the deviations, and requires only one division per class instead of one division per cell. It can be extended to three observed distributions, but loses its computational advantages for more than three.

If we have k samples, and each has been classified into m classes, the formula for χ^2 is of course:

$$\chi^2 = \sum_{i=1}^{m}\sum_{j=1}^{k} \frac{(\text{observed frequency-expected frequency})^2}{\text{expected frequency}}$$

For $k = 2$, R. A. Fisher [1] gave the simplified formula

$$\chi^2 = \sum_{i=1}^{m} \frac{NN'}{f_i + f'_i}\left(\frac{f_i}{N} - \frac{f'_i}{N'}\right)^2, \quad \text{d.f.} = m-1$$

where the class frequencies are f_i and f'_i respectively for the i-th class and N and N′ are the total counts in each sample.

When $k = 2$ and the total counts in each sample are equal ($N = N'$ above), the formula simplifies to:

$$\chi^2 = \sum_{i=1}^{m} \frac{(f_i - f'_i)^2}{f_i + f'_i}, \quad \text{d.f.} = m - 1$$

Therefore, for each class, take the difference between the observed counts, square the difference, divide by the sum of the two counts, and sum over all classes. The proof is obvious.

The method can be extended to three observed distributions with equal total counts. For each class, take all 3 differences among the counts and sum their squares; divide by the sum of the 3 counts and sum over all classes.

For more than 3 distributions, the difference method has no computational advantage. In this case it is convenient to use the general formula in the following form [2]:

$$\chi^2 = n\left(\sum_{i=1}^{m}\sum_{j=1}^{k} \frac{f_{ij}^2}{n_i C_i} - 1\right)$$

where f_{ij} = frequency for j-th sample in the i-th class
n_j = total count for j-th sample
C_i = total count for i-th class
n = total count.

The short-cut was first noted in connection with a problem of sampling pebbles in geology. At each of various sites, the geologist took two samples of 150 pebbles and classified the pebbles by lithology. His interest was in comparing the two samples at a site, as a check on his sampling technique.

REFERENCES

[1] R. A. Fisher, "On the Interpretation of χ^2 from Contingency Tables and the Calculation of P", J. R. S. S., *85*, 1922, pp. 87-94.

[2] A. Hald, "Statistical Theory with Engineering Applications", John Wiley and Sons, Inc., 1952, p. 747.

A NOTE ON THE GRAPHIC METHOD FOR OBTAINING A LEAST SQUARES FIT

by ***Robert H. Riffenburgh, University of Hawaii***

Askovitz [1] presents a method for obtaining a least squares fit for a straight line to a series of points by use of coordinate paper and a straight edge. Two sets of several points each are determined sequentially on a graph, each point being a function of prior points. The last point determined for each set is used as one of the two points determining the least squares line. Two comments are in order.

First, since the points are determined sequentially, any error made will be passed along to subsequent points and perhaps magnified. Nothing can be done to avoid this other than to give scrupulous attention to accuracy.

Second, small errors are inherent in graphical methods, and the sequential determination of points suggests additivity of these graphical errors. Even the use of draftsman's equipment and methods only improves the accuracy of the estimate; it remains an estimate. However, this debility can be avoided. If the points are computed numerically rather than plotted graphically, each point will be exact (provided, of course, each datum is exact and computational errors are avoided).

[1] Askovitz, S. I. "A short-cut method for fitting the best straight line to a series of points according to the criterion of least squares", Journal of the American Statistical Association, *52* (1957), 13-17.

This numerical method may not be remarkably faster than the usual least squares procedure, but it is somewhat simpler computationally and should present an easier computational concept to the statistically uninitiated.

Suppose we are given the k data points (x_i, y_i), $i = 1, 2, \ldots, k$, for which $x_{i+1} - x_i = s$. Let us define two new sets of points:

(x'_i, y'_i) for which $x'_k = x_1 + \frac{2k-2}{3}s$ and the successively determined $y'_i = \frac{i-1}{i+1}y'_{i-1} + \frac{2}{i+1}y_i$, $i = 1, 2, \ldots, k$;

(x''_i, y''_i) for which $x''_1 = x_k - \frac{2k-2}{3}s$ and the successively determined $y''_{k-i+1} = \frac{i-1}{i+1}y''_{k-i+2} + \frac{2}{i+1}y_{k-i+1}$, $i = 1, 2, \ldots, k$. The two points (x'_k, y'_k), (x''_1, y''_1) correspond to Askovitz' T, U respectively. Simultaneous solution in the equation $y = a + bx$ uniquely determines the parameters a, b for the least squares line.

The arithmetic mean, $\bar{y}$, of the y-values may be easily found by $\bar{y} = a + \frac{b}{2}(x'_k - x''_1)$.

JOB OPENING

The Naval Civil Engineering Laboratory at Port Hueneme, California has a position available for a Mathematical Statistician, GS-13 ($10,130-$11,090 per annum). The selectee will serve as consultant to the Laboratory's technical personnel in the field of design of experiments and he will perform basic research in the theory of mathematical statistics as needed.

A complete knowledge of the modern methods of mathematical statistics plus a college degree and a minimum of 4 years experence in mathematical statistics is required.

Send either a resume or a federal application form (Standard Form 57) to:

Personnel Officer
U. S. Naval Civil Engineering Laboratory
Port Hueneme, California

ANNUAL MIDWEST CONFERENCE IN CHICAGO *

De Ver Sholes, Chicago Association of Commerce and Industry

For five years the Chicago Chapter, American Statistical Association and the Chicago Association of Commerce and Industry have cooperated in producing a series of worthwhile meetings in the field of statistics. These meetings have been called "Midwest Conference On ....." and have been truly regional in character. The attendance has been approximately one-third persons from outside the Chicago Metropolitan Area and two-thirds persons from the Chicago Metropolitan Area itself. We have had persons come from as far away as Montreal, Toronto, New York, and Denver. Sizable attendance has been obtained from Detroit, Minneapolis, St. Louis and other major midwest centers.

The Midwest Conference series was inaugurated in 1954 with a dual purpose in mind. The first desire was to serve the members of the Chicago Chapter and other midwest persons with an interest in statistics with a broader program than could be undertaken at the usual luncheon and dinner meetings presented by the Chicago Chapter. The second objective was to obtain revenue for the Chicago Chapter to make it unnecessary to increase dues. Both of these objectives were fulfilled until 1958, when a small deficit was incurred.

The subject matter of these conferences has been different each year. The first dealt with forecasting techniques (300); the second, an evaluation of business indicators (220); the third, business tools for decision making (150); the fourth, piercing the communication barrier with statistics (235); and the fifth, measuring metropolitan area growth (175). Figures in parentheses indicate the attendance at each conference. Each of the conferences has been one day and held on Saturday, with the exception of the third Conference which was a day and a half, held on Friday and Saturday. The attendance at the third Conference, the two day session, was higher on Friday, with 200 people attending the luncheon meeting, but only 115 fulltime registrants for both days. The attendance was better on Friday than on Saturday. Our experience in 1958 has indicated that a Saturday conference has become much less desirable for persons in the Chicago Metropolitan Area, and it is believed it would be possible to draw a much larger audience on a weekday, which is recommended for this year.

Fees for the Conference have varied according to the expense of the location. For the first two conferences, a fee of $7.50 was charged; for the third conference (two days) $15 was charged; and for the fourth and fifth Conferences the charge was $10.00 each. The cost varied according to the physical facilities used, and these were dictated in part by program requirements. The cost of meals is also an important factor.

The publishing of proceedings was never scheduled at these Conferences until the funds were in hand. If money was not available for the publishing of proceedings then no commitment to publish them was made. In the third conference no proceedings were published. The Chicago Association of Commerce and Industry has worked out with the chapter the following rule of thumb:

If the proceeds of the Conference are large enough to produce proceedings, and if the Chapter board votes that proceedings should be produced, all the net proceeds of the conference, after the deduction of expenses, will be turned over to the Chapter for this purpose. Whatever the Chapter can net after the proceedings are produced belongs to the Chapter. In case the Chapter decides funds are not available to produce proceedings, whatever funds are available will be shared equally between the Chicago Association of Commerce and Industry and the Chicago Chapter.

The planning of the program for the Conference has been left in its entirety to the Chicago Chapter, with the cooperation of a member of the Chicago Association of Commerce and Industry staff. The Conference Committee of the Chicago Chapter has always worked diligently during the winter months to select the conference subject and prepare the topics and select speakers. The contacting of speakers has been a joint project of the chapter and the Chicago Association of Commerce and Industry representative.

The preparation of the announcement piece, the mailing of the announcements, and the registration and ticket sales have all been handled by the Chicago Association of Commerce and Industry. All funds have been handled by the Association of Commerce and Industry, and it has made a large contribution in time and effort in handling the ticket sales and distribution of the mail pieces.

Mailings have been made throughout the Midwest to organizations such as the American Statistical Association, the American Marketing Association, the American Economic Association, the American Society for Quality Control, the American Institute of Planners, and the Investment Analysis Club depending on the interest of these organizations, in the subject matter of the meeting. Total mailings were about 21,000 pieces for each conference. There is a great deal of duplication in the membership of some of these organizations, but that cannot be eliminated on a broadside mailing of this type.

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* EDITOR'S NOTE:
The American Statistical Association encourages the holding of regional meetings throughout the country. The experience gained by the Chicago Chapter is given below for the benefit of other chapters which may want to initiate such conferences in their own areas.

When this program of meetings was first established, Sam Weiss, then Secretary of the American Statistical Association, indicated that he was willing to guarantee the Chicago Chapter against loss in this operation. This meant that the national Association would assume any loss that the Conferences incurred. Although the national Association has met the cost of mailings to Association members in the Midwest for the past five conferences, it has indicated inability to meet these expenses in 1959. Therefore, the expenses of this mailing will, of necessity, have to be deducted from the proceeds of this meeting, as are all the mailings of the other Associations.

This, in brief, is a description of how the first five Midwest Conferences have been handled. We believe other chapters may want to have regional conferences of the same or a similar type, and that this experience may be helpful to them. We would strongly urge, in having meetings of this character, that the chapters should attempt to co-sponsor with some large local organization the conduct of these meetings. A co-sponsoring organization could be a Chamber of Commerce, a university, or some other local interested organization, which would give the local chapter a great deal of assistance in the planning and arrangement of such a Conference. The Chicago Association of Commerce and Industry has been helpful to the Chicago Chapter in making arrangements and handling the mailing and ticket sales for the Chicago Midwest Conference, and in providing a permanent address and facilities for financial assistance and professional talent. It is willing to continue this arrangement indefinitely because it feels that these Conferences are very worthwhile meetings, and have a truly regional character which has been beneficial to the business statisticians.

One final comment about subject matter. It has been the experience of the Chicago Chapter over many years of having meetings on statistics that the largest attendance can be secured for topics dealing with "business statistics". Because of the financial commitments that must be made in the planning of such a conference, including printing, mailing expenses, and meeting arrangements, a large attendance is a prerequisite for a conferences of this type. Subjects on other than the business field may be of interest to a smaller number of persons but will not have a general application to pull the required attendance for the Conference. While it might be desirable for certain segments of the population of statisticians to have meetings of their own, this is not feasible for a Midwest Conference of the type described above. To indicate the magnitude of the financial commitments for the Fifth Midwest Conference, the expenses were in the neighborhood of $1,500, which means that with a paid attendance of 150 persons at $10.00 each a small deficit was incurred last year.

FEDERAL STATISTICAL ACTIVITIES—CONTINUED FROM PAGE 13

and defines terms relating to these concepts and other items of information obtained in the survey. Includes discussion of the reasoning and experience underlying decisions on concepts and definitions, and problems encountered in developing the household interview part of the National Health Survey. Available at 30¢ a copy from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

National Health Survey — Selected Survey Topics, United States, July 1957-June 1958 (Public Health Service Publication No. 584-B5), issued by the U. S. Public Health Service. Presents the first data from the National Health Survey based on four quarters of household interviewing. Topics covered include disability, acute and chronic conditions (not covered in previous releases), number of persons injured by class of accident, number of physician visits, and number of dental visits. Contains a section on population estimates used in computing rates, and appendixes describing the survey methods and defining the terms used. Available at 40¢ a copy from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Statistics of Income—1956, issued by the Statistics Division, Internal Revenue Service. Reports presenting financial data from tax returns. The two following reports for the income year 1956 were published several months earlier than for any previous year:

Preliminary Report, Corporation Income Tax Returns —1956-57 (25 cents)

Complete Report, Individual Income Tax Returns—1956 (65 cents)

These two reports may be purchased at prices indicated from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Advance individual income tax data—1957, released December 26, 1958 by the Statistics Division, Internal Revenue Service. Selected data completed, for the first time, within the year in which the returns were filed. The news release may be secured from Helen Demond, Chief of the Income, Finance, and Wealth Branch, Statistics Division, Internal Revenue Service.

EFFECTIVE BUSINESS FORECASTING TECHNIQUES

How Forecasts Can Minimize Business Risks

Modern Methods Are More Of A Science And Less Of An Art

SIXTH MID-WEST CONFERENCE, THURSDAY, MARCH 26, 1959
THE PICK-CONGRESS HOTEL, CHICAGO, 8:45 A.M. TO 5:00 P.M.

Nine eminently qualified, practical technicians will discuss their methods—in detail—for guiding top management decisions.

Every policy maker knows that, like it or not, he must look to the future. His every major move must be based on some Forecast. Modern and proven techniques now exist that are capable of greatly reducing the uncertainty about what lies ahead for the business man.

The outstanding experts who will discuss Forecasting from the philosophical, practical and case study approaches are:

IRA BRICHTA	Regional Director, Sales Communication Inc. (McCann-Ericson) Chicago
GERHARD COLM	Chief Economist, National Planning Association, Washington, D.C.
MORRIS T. GOTTLIEB	Vice President, Market Facts Inc., Chicago
J. EMMET JUDGE	Mercury Marketing Manager, Ford Motor Co., Dearborn, Michigan
ALFRED A. KUEHN	Professor, Graduate School of Industrial Administration, Carnegie Institute of Technology, Pittsburgh, Pennsylvania
JOHN K. LANGUM	President of Business Economics Inc., Chicago
RODNEY C. RICHARDSON	Manager, Market Service, Minnesota Mining & Mfg. Co., St. Paul, Minnesota
*PAUL W. McCRACKEN	Recent member of President's Council of Economic Advisors, now Professor, School of Business Admin., University of Michigan
LEONARD SILK	Economics Editor, Business Week Magazine, New York

* *Luncheon Speaker*

Topics of the All-Day Forecasting Conference Are:

- . . . Highlighting the Role of Statistics in Forecasting
- . . . The Practical and Philosophical Approaches to Forecasting
- . . . Techniques of Forecasting the Long-Run Secular Growth in the Economy
- . . . Methods of Forecasting the Short-Run Business Cycle
- . . . Current Forecasts' Affect Upon Federal Governmental Policies
- . . . The Theoretical Role of Forecasting New Product Development
- . . . Practical Approaches in Forecasting Size and Share of the Market
- . . . Implementing Distributors and Retailers Appliance Forecasts
- . . . An Evaluation of Research Data in Preparing a Forecast for the Automotive Industry

***Sponsored By:* Chicago Chapter of the American Statistical Association —*and*—Chicago Association of Commerce and Industry**

REGISTRATION CARD

The Chicago Association of Commerce & Industry

30 West Monroe Street
Chicago 3, Illinois

Attached is check payable to the Chicago Association of Commerce and Industry, for $_____ for _____ registrations at $12.00 for the Sixth Annual Mid-West Conference including luncheon to be held at The Pick-Congress Hotel, Chicago, March 26, 1959.

Please attach list of names of persons attending.

NAME _____

ADDRESS _____

FIRM _____

(Luncheon only: $5.00)

ELECTION OF NEW FELLOWS

At the Annual Meeting in Chicago the Committee on Fellows, composed of Paul S. Olmstead, Chairman, Martin R. Gainsbrugh, Chester I. Bliss, Churchill Eisenhart, and Frederick Mosteller, announced the election of the following new Fellows:

Harry Alpert, Professor of Sociology and Dean of the Graduate School, University of Oregon: for his activities in the American Statistical Association both as a chapter officer and as a member of numerous hard-working committees; for his government service in the Office of War Information, the Division of Statistical Standards of the Bureau of the Budget, the Human Resources Division of the United States Air Force, and most recently in the National Science Foundation; for his work in the field of public opinion research; and for his numerous contributions to sociology.

Louis H. Bean, Economic Statistician and Consultant, and Economic Advisor to three former Secretaries of Agriculture: for his historic contributions to correlation methodology and to long-range agricultural forecasting; and, in the political science field, for his highly original formulation of methods of statistical study of factors influencing voting behavior.

Ernest J. Engquist, Jr., Director of the Statistics Division, Internal Revenue Service, United States Treasury Department: for successfully pioneering the adaptation of large input and output of related data to high-speed electronic data processing; and for applying a broad knowledge of statistics so as to improve the meaning, timing and quality of income statistics and business indicators.

Walter T. Federer, Professor of Biostatistics, Cornell University: for his leadership in extending the field of statistics as a writer, teacher and advisor on biometric problems; for increasing our stock pile of experimental designs; and for the comprehensive survey of the field in his book, "Experimental Design."

John W. Fertig, Professor of Biostatistics in the Faculty of Medicine at Columbia University: for his skill in the application of statistics in medicine; and for his outstanding contribution through publications and consultations to the advancement of medical and public health research, both in this country and throughout Latin America, in part made possible by his fluency in foreign languages.

Ezra Glaser, Head, Washington Office, National Analysts, Incorporated: for his activity in extending the use of statistics in the fields of operations research, computers and management science; for his important contributions to social science research; and for his leadership in the Washington Statistical Society.

Edwin D. Goldfield, Chief, Statistical Reports Division, Bureau of the Census: for his important contributions to sample survey techniques of the labor force, consumer income and administrative statistics; and for extending the use of statistics through activity on committees and through membership in allied societies.

Wassily Hoeffding, Professor, University of North Carolina: for his teaching and for his extensive contributions to the field of mathematical statistics, including investigations of order statistics, of the power and efficiency of tests, of certain problems in the theory of probability, and of the theory of asymptotic distributions.

Abram J. Jaffe, Director of the Manpower and Population Program of the Bureau of Applied Social Research at Columbia University: for his substantial contribution to the study of causes and consequences of demographic, labor force and related socio-economic changes, both in the United States through his work at Columbia University and as consultant to the Commonwealth of Puerto Rico and to the United Nations on manpower statistics.

John E. Kerrich, Senior Lecturer in charge of Statistics, University of Witwatersrand, and Statistical Advisor, Bureau of Standards and National Physical Laboratory of South Africa: for his contributions to the literature of mathematical and applied statistics, for which he is recognized far outside South Africa.

William H. Kruskal, Associate Professor of Statistics, University of Chicago: for his contributions to the advancement of the field of statistics through his patient teaching, through his editorial work, and through numerous original articles on statistical methodology including contributions to nonparametric methods, sequential analysis and the study of contingency tables.

Henry L. Lucas, Jr., Professor of Experimental Statistics, North Carolina State College: for his research, advice and many publications that have enlarged materially the role of statistics in the design of animal experiments and have added to our knowledge of animal nutrition.

Ellis R. Ott, Professor and Chairman, Applied and Mathematical Statistics, University College and the Graduate School, Rutgers University: for his untold effort in recognizing and meeting industry's need for training in applied statistics at Rutgers; for his help in introducing Statistical Quality Control in India; and for his energetic leadership in the American Society for Quality Control.

William H. Shaw, Manager, Business Economics Section, Textile Fibers Department, E. I. duPont de Nemours and Company, Incorporated: for his pioneering work at the National Bureau of Economic Research and the United States Department of Commerce in developing long-term estimates for (1) the value of commodity output, (2) consumption expenditures, (3) new construction, and (4) producers' durable equipment; and for his continuing contributions subsequently toward improvement of the body of current business intelligence.

Herbert S. Sichel, Director, Operational Research Bureau, Johannesburg, South Africa; for his outstanding leadership in the application of statistics to a wide range of industrial and social problems in his country.

Lazare Teper, Director of the Research Department at the International Ladies' Garment Workers' Union: for his frequent contributions on problems of statistical measurement and its improvement in various statistical journals; and for his untiring efforts as consultant to government and private agencies to improve the quality of economic statistics.

Benjamin J. Tepping, Associate Professor of Statistics, University of Pennsylvania, and Member, National Analysts' Staff: for application of rigorous statistical and sampling methods in censuses and elsewhere; for his contributions to the literature of operations research; and for his many years of tireless effort as a teacher of statistics.

James Tobin, Sterling Professor of Economics and Director, Cowles Foundation for Research in Economics, Yale University: for his leadership and painstaking original research in econometrics and allied disciplines; and for his scholarly contributions toward better understanding and resolution of problems in consumer credit and related areas of public policy.

Mary N. Torrey, Member of Technical Staff, Bell Telephone Laboratories: for her contributions to the theory of Sampling Inspection, for her able analyses of engineering data, and for her clear and concise presentation of Statistical Quality Control in Electronics.

David van Dantzig, Professor of the Theory of Collective Phenomena, University of Amsterdam, and Head of the Departments of Statistics and Applied Mathematics, Mathematisch Centrum, Amsterdam: for his extensive contributions to mathematical statistics and its economic applications; and for his leadership in many major scientific organizations in the Netherlands.

Mason E. Wescott, Professor of Applied Statistics, University College and Graduate School, Rutgers University: for his numerous articles on Statistical Quality Control; for his leadership in presenting sound statistical theory at the elementary level, first as a member of a short course faculty and later as the Chairman of the Editorial Board of Industrial Quality Control; and for his contribution to the spread of Statistical Quality Control in India.

NEWS ABOUT MEMBERS

Fortunata V. Altmayer has been promoted from Engineer to Senior Engineer in the American Bosch Arma Corporation Computational Laboratory's Analysis Section.

Dean V. Babst has moved to Olympia, Washington, where he is now employed as a Statistical Analyst in the Research and Statistics Unit of the Public Assistance Division. Prior to this, he was a Statistican for the Montana State Department of Public Welfare at Helena, Montana.

Robert Bechhofer is on sabbatic leave from the Department of Industrial and Engineering Administration, Sibley School of Mechanical Engineering, Cornell University for the academic year 1958-59. He is spending this period as Visiting Professor of Statistics in the Applied Mathematics and Statistics Laboratory and in the Department of Preventive Medicine, Stanford University.

Bernard P. Bernsten, formerly Economist and Research Analyst with The Econometric Institute, Inc., in New York City, is now a staff Economist with the United States Chamber of Commerce in Washington, D. C. His position is Secretary of the National Chamber's Committee on Business Statistics.

Martin Bernstein is a Statistician in the Division of Prices and Cost of Living of the Bureau of Labor Statistics, U. S. Department of Labor.

Albert H. Bowker was made Dean of the Graduate School, Stanford University, on December 1, 1958.

William P. Bulger joined the Red Star Yeast & Products Company, Milwaukee, Wisconsin, as Market Research Manager on January 1. He previously worked for Simoniz Company as Consumer Research Supervisor.

Robert R. Bush has taken the position of Chairman of the Department of Psychology, University of Pennsylvania, Philadelphia.

Larry W. Cheeves, formerly with Owens-Corning Fiberglas Corporation, is now an Operations Research Analyst with the Convair Division of General Dynamics at Fort Worth, Texas.

George A. Cooper, President of Tabulating and Business Services Inc., has been conducting a Market Research Tabulating Seminar in conjunction with the Business Machines Institute.

Rex Daly, formerly Head of the Income and Demand Section, Farm Income Branch, Agricultural Marketing Service, has transferred to the International Cooperation Administration for an assignment with the Economic Mission to Pakistan.

Joseph S. Davis has resigned as a member of the Council of Economic Advisers and has returned to his home at Palo Alto, California to engage in private research.

Dorsey E. Dean, formerly Manager of Statistical Quality Control for the North American Tire Plants of the Firestone Tire and Rubber Company, Akron, Ohio, has joined the Cocoa Division of the Martin Company as a Senior Quality Assurance Engineer in the Research and Analysis Group. This division of the Martin Company is located on Cape Canaveral in Florida.

Arthur N. Doi is now a Quality Control Engineer of the Reliability Control Staff, Aerojet-General Corporation at Sacramento, California.

Louis I. Dublin, former President of the American Statistical Association, now resides in Winter Park, Florida. He continues to act as Consultant on Health and Welfare of the Institute of Life Insurance of New York and directs the Public Service Program of that organization.

Luis A. Fuenzalida is a member of the faculty of the Department of Economics at the Catholic University of Chile, Santiago, and is also a researcher at the Center of Economic Research in the same University. During the current year, he is teaching the course on Price Theory and another on Mathematical Economics.

Esther C. Jackson is now employed as a statistician with the Naval Inspector of Ordnance at the Naval Gun Factory, Washington, D. C.

Saul Kaplan, formerly a Mathematical Statistician in the Statistical Methods Branch of the Population Division, Bureau of the Census, has resigned to become Director of Research for the Allegheny County Health and Welfare Association in Pittsburgh.

Michael Kobryn is working as Analytical Statistician in Warner-Robins in Georgia.

Boyd Ladd has joined the Johns Hopkins University Operations Research Office, and will be working in the field of Management Systems for Army and industry.

Sebastian B. Littauer has been appointed as Consultant in Operations Research and Statistical Quality Control, Calkin & Bayley, Inc., industrial consultants of New York. Dr. Littauer is also Professor in Statistical Quality Control and Operations Research at Columbia University.

A. A. Lumsdaine recently joined the staff of the American Institute for Research in Pittsburgh, where he is Program Director for research in training and education.

George Minton has transferred from the Economic Operations Division, Bureau of the Census, to the Operations Research Branch of the Statistical Research Division as a Mathematical Statistician.

K. R. Nair attended, as the official representative of the Indian Society of Agricultural Statistics, the 31st (Extraordinary) session of the International Statistical Institute held at Brussels, September 3-8, 1958. He was elected an ordinary member of the I.S.I. in the 1958 ballot.

Joseph T. Neville, formerly an Analytical Statistician in the Income, Finance and Wealth Branch, Statistics Division, Internal Revenue Service, has been reassigned as a Mathematical Statistician in the Sampling and Estimating Methods Section, Program Analysis and Reports Branch.

Dorothy K. Newman, Assistant Chief of the Construction Statistics Division, Bureau of Labor Statistics, will spend the first half of 1959 in a part-time study for the Labor Department on workers' housing in Great Britain and other European countries.

Jerzy Neyman, Director, and Elizabeth Scott, Associate Professor, Statistical Laboratory, University of California, received the Newcomb Cleveland prize—the highest award—of the American Association for the Advancement of Science for their paper "On Stochastic Models of Population Dynamical Phenomena," as representing an outstanding contribution to science. The paper was presented at the December meeting of the AAAS in Washington.

George J. Palmer, Jr., is Assistant Professor of Industrial Psychology at Tulane University teaching Statistics, Industrial Relations and Psychology, and conducting research on business games, decision-making, executive training, etc.

Harry Press has been transferred from the Langley Research Center of the National Aeronautics and Space Administration to the Headquarters Office in Washington, D. C., where he has assumed the duties of Chief, Materials and Structures Division.

Paul Rackow, who has been an Economic Analyst with the Port of New York Authority for the past six years, is working toward a Master's degree in Statistics at the New York University Graduate School of Business.

Ramon Sabadi Rodriguez is now the Chief of Customs Statistics of Cuba and is also a professor at the "Center of Statistical Development."

Edward Sax is employed at the Hughes Tucson Engineering Laboratory at Tucson, Arizona as a Mathematician-member of the Technical Staff.

David Schwartzbard has a new position with the Chrysler Corporation as a Programmer Analyst.

William H. Shy has resigned from the Florida Power & Light Company to join a new Operations Research group in the Consumer Products Division of Kimberly-Clark Corporation, Neenah, Wisconsin.

H. W. Steinhaus has opened a joint office with J. J. Smick for actuarial services, including pension and other employee benefit plans, at 200 East 42nd Street, New York City. Dr. Steinhaus was associated with the Equitable Life Assurance Society for 20 years until his retirement in 1957. In addition to consulting work, he teaches two insurance courses in the Graduate School of Business at Columbia.

Conrad Taeuber, Bureau of the Census, was elected Chairman of the Board of Directors of the Social Science Research Council at the Board's September meeting.

Howard L. Taylor has joined the Mathematical Analysis Group of the Gulf Re-

search and Development Company, Pittsburgh.

Ray Twery has joined the Gardner Advertising Company, St. Louis, as Research Group Supervisor. A primary function will be to provide technical support to the statistical and operations research activities. He formerly was a management consultant with Peat, Marwick, Mitchell & Company in Chicago.

Christian F. Verbeke has resigned his position as Statistician and Data Analyst, Assistant to the Matrix Division Manager of Photon, Inc., Cambridge, to accept a position as Documentation Engineer in the Information Services Department of Itek Corporation, Waltham, Massachusetts.

Laura Mae Webb, who has been with the Office of Statistical Standards, Bureau of the Budget, since 1945, has transferred to the Agricultural Research Service, Department of Agriculture, where she has been appointed Chief of the Family Economics Branch, Household Economics Research Division.

Donald E. Young has recently completed a 2-year assignment with the Manila mission of the International Cooperation Administration as Statistical Advisor to the Philippine Government, assisting in the development of new techniques and procedures for statistics collection. He is a staff member of the Bureau of the Census.

Virginia Zachert has joined the staff of Sturm & O'Brien, consulting engineers, Auburn, Alabama, as Director of the Division of Mathematics and Data Processing.

Leonard W. Hatch died on November 23, 1958 at the age of 89. He was a graduate of Oberlin College and received the Ph.D degree from Columbia in 1905. Entering the New York State Department of Labor in 1897, he served under 14 Governors of New York. For several years he was Director of the Bureau of Statistics and Information, and prior to his retirement in 1935 he was a member of the New York State Industrial Board. He was a Fellow of the American Statistical Association.

CHAPTER NOTES

Albany

A joint meeting was held on January 15 with the Albany Section of the American Society for Quality Control. The meeting began at 4:30 with an open discussion on "Quality Control Techniques in Office Procedures", with Karel Ficek, New York State Department of Labor, as Moderator. This was followed by a Marchant machine exhibit, and by dinner at 6:30. The guest speaker of the evening was Theodore H. Brown, Professor Emeritus of Business Statistics, Harvard University Graduate School of Business Administration, whose subject was "Estimates of Tomorrow".

Austin

The Austin Chapter, meeting in July at the University Tea House, heard the President, Tom H. Taylor, discuss the "Tourist Industry in Texas", with illustrative slides. At this meeting John R. Steele of Southwestern Bell Telephone Company was elected President; George B. Strong, U.S.D.A. Crop Reporting Service, Vice-President; Stella Traweek, Secretary-Treasurer; and A. D. Morgan, Texas Highway Department, Information and Membership Chairman.

In August the new officers were installed at luncheon at the Terrace Restaurant. Each member present gave a brief description of his own work with statistics.

On September 30 the new President, John Steele, discussed the use of statistics and statistical methods by the Telephone Company. The luncheon was at the University Tea House.

On November 18 the Chapter heard Dr. M. J. Thompson, Professor of Aeronautical Engineering and Associate Director of the Defense Research Laboratory at the University of Texas, speak on research in missiles and space flight. Mexican lunch was served at El Matamoros.

The student chapter — Norman Fox, President—in October heard Dr. John R. Stockton discuss the work of the University Bureau of Business Research. In November, Mr. N. K. Woerner, Manager of Statistical Services, Texas Department of Public Safety, talked on the use of statistics by his Department, particularly in regard to traffic accident prevention. Both meetings were at the University Tea House.

Buffalo-Niagara

"New Trends in Statistics" was the title of the talk given by Mr. Robert H. Matthias, Supervisor of Operations Analysis of the E. I. Du Pont Corp., at the October meeting of the Buffalo-Niagara Chapter. This broad and demanding topic was enhanced by Mr. Matthias' practical experience. He covered some of the latest advances in experimental design including the techniques of G. E. P. Box and his associates, together with some discussion of the concept of random balance. Areas of application of statistics, including work sampling and decision theory were also examined.

A lively discussion period followed which centered upon the necessary criteria for the evaluation of a contribution to statistical theory as compared to a new application of older theoretical concepts.

New officers for the Chapter for the year 1958-1959 are:

President—Arthur Stein, Cornell Aeronautical Laboratory
Vice President — Dr. Richard N. Schmidt, University of Buffalo.
Secretary-Treasurer—Edward G. Schilling, University of Buffalo

The meeting of December 11th was devoted to Statistical Decision Making. Mr. Charles A. Bicking, Manager of Quality Control, Research and Development Division, the Carborundum Co., Niagara Falls, New York, presented a paper titled "Statistical Aids to Decision Making". Mr. Bicking stressed the point that statistics in industry implies a design for decision and that the design fundamentally must be based on statistical data. The scarcity of essential data is usually a critical problem, consequently, a good deal of attention must be paid to the design used for interpreting the data.

The aim of any statistical decision plan is to combine careful estimates of costs and of returns with equally carefully estimated probabilities of the occurrence of various outcomes of alternative courses of action. When costs, returns and probabilities are combined, the value or desirabilities of the alternatives are expressed in quantitative terms. A comparison of the desirabilities of the several possible courses of action enables the manager to choose the most favorable one.

Mr. Bicking cited the seven steps in decision making and six rules for choosing alternatives. Specific examples were given for decision design illustrating the seven steps and the six rules. Mr. Bicking called upon Mr. Sigmund Zobel, Senior Engineer in the Quality Control Department of Carborundum, to discuss a decision project utilizing imputed cost values in the case of a capital equipment decision where the typical techniques do not allow for a clearcut decision.

Following the paper there was a lively period of discussion centered around the decision rules and the problem of estimating probabilities.

Central Indiana

"Looking Ahead to 1959—Methods and Forecasts" was the subject of the December 4 meeting held in the Union Building of Indiana University Medical Center in Indianapolis. Dr. John P. Lewis, Professor of Business Economics and Public Policy at Indiana University, was the principal speaker. Panelists were Dwight Kelley, Indiana Employment Security Division; John Hanson, Eli Lilly and Co.; and Professor R. E. Straszheim, Purdue University.

At the January 8 meeting, also held at the Indiana University Medical Center, Dr. A. H. Ismail, Department of Physical Education, Purdue University, spoke on "Statistical Procedures for Analyzing Indiana Farm Accident Survey Data". Dr. Ismail discussed the statistical aspects of an intensive farm accident survey made in nine Indiana counties during 1958.

Chicago

A luncheon meeting was held on October 30, at which Beryl W. Sprinkel, Economist with the Harris Trust Co., spoke on "Changes in the Money Supply as an

Initiator of Business Upturns". Mr. Sprinkel told the Chapter that "Both theoretical reasoning and empirical evidence support the contention that the change in the growth of the money supply is a fundamental factor initiating business downturns and upturns".

The second dinner meeting, preceded by a late afternoon session on a technical subject, was held on November 13. At the afternoon session Dr. Horace P. Andrews of Swift & Company discussed "Evolutionary Operation". Dr. Andrews described the new statistical quality control method which was introduced by the famous British statistician, Dr. George E. P. Box, as the application of the "rock and roll" process. The after-dinner speaker was Walter E. Hoadley, Jr., Treasurer of Armstrong Cork Company and President of the American Statistical Association. Dr. Hoadley spoke on the subject, "Construction Leads the Way Out of the Recession". While pointing out that construction statistics undoubtedly indicate an upturn in construction activity, he noted that neither the magnitude nor the duration could be determined precisely with the available data. During the question and answer period which followed the talk. Dr. Hoadley discussed steps which are being taken to improve construction statistics.

A joint luncheon meeting with the Chicago Chapter of the American Marketing Association was held on November 25 at which Dr. Willard W. Cochrane, visiting professor at the University of Chicago, discussed "Expanding the Demand for Food Opportunities and Limitations". Professor Cochrane described a major research project on this subject recently completed at the University of Minnesota.

The December 18 luncheon meeting was devoted to the subject, "Business Outlook —1959". The speakers were George W. Cloos, Senior Economist, Federal Reserve Bank of Chicago, and Frank Hoeber, Director of Research, Borg-Warner Corporation. At the January 8 luncheon meeting held jointly with the Chicago Chapter of the American Marketing Association, David K. Hardin, Vice-President of Market Facts, Inc., discussed "Dangers, Dreams and Delusions in Motivation Research".

The Chicago Chapter has written the Governor of Illinois and the State Civil Service Commission to protest the removal of the position of the Chief of the Division of Research and Statistics of the Department of Labor from Civil Service status. The letter also noted that salary levels for statistical positions in Illinois were lower than those offered in comparable states, and urged that the question of adequacy of salary schedules for the various grades of Statistician and Research Analyst be reviewed and reconsidered.

Cleveland

Officers for 1958-59 are:

President—ARTHUR S. LITTELL, School of Medicine, Western Reserve University

Vice-President and Program Chairman —RICHARD SHAW, Mallory Battery Co.

Secretary and Treasurer—CHARLES H. JOSEPH, JR., The World Publishing Company

Arrangements Chairman — CLAUDE L. CORNETT, Standard Oil Co. of Ohio

Membership Chairman — MORRIS DARNOVSKY

Detroit

The Chapter's new officers for 1959 are:

President—HUGH R. BROWN, Business Research Staff, General Motors Corp.

Vice-President—HAROLD BELL, Business Research Dept., Chrysler Corp.

Secretary-Treasurer—DONALD J. FLESHER, Marketing Research Office, Ford Motor Company

Milwaukee

At the October meeting the speaker was Dr. Roman S. Gawkowski, Coordinator of Testing, Marquette Guidance Center. He spoke on "Evaluation of Interest Patterns by Statistical Methods."

At the December meeting the Chapter heard Mr. Elam E. McElroy, Associate Professor of Business Administration, Marquette University, speak on "The Business Road Ahead." Also at this meeting, the newly elected officers for 1959 were announced:

President—JAMES B. SCHULTZ, Management Statistician, Milway, Inc.

Vice-President—NORMAN J. KAYE, College of Business Admin., Marquette University

Secretary-Treasurer—JOSEPH W. MCGEE, Department of Sociology, Marquette University

Recording Secretary—EDWARD F. HORNICK, Sampling Applications, Wisconsin Telephone Company

Montreal

On October 8 the Chapter had the pleasure of hearing Mr. Douglas K. Dale, Chief of Sampling and Analysis Section, Dominion Bureau of Statistics, Ottawa. The speaker presented a most interesting talk on "The Canadian Labour Force Survey and Associated Reports". The November 12 meeting was devoted to a panel discussion on "Economic Forecast for 1959". The panel members, Dr. D. E. Armstrong, McGill University, Mr. J. D. Wahn, Canadian National Railways, and Mr. A. J. Steigmann, Bell Telephone Company, were quite successful in creating and maintaining the interest of the auditors as the lively discussion that followed showed.

The discussion group has had two meetings devoted to the general topic of "Non-parametric Methods". On October 22 the first speaker, Dr. G. A. Ferguson, McGill University, talked on "Observations on the Application of Non-parametric Tests". On November 26 Dr. Gilbert Paul, McGill University, brought "An Example in the Use of Ranking Methods". The long and most interesting discussion that followed showed how much the attendants appreciated the opportunity of having such "exposes" of technical topics.

New York

"Factorial Design" was the topic of the November 6 meeting. Dr. Chou Hsuing Li, Radio Corporation of America, discussed the mechanics of a worksheet developed by him to simplify the Box technique of finding the optimum conditions in problems involving many factors. Mr. E. Cupo of the Sperry Rand Corporation described the basic functions and advantages of factorial designs. He particularly stressed the value of employing high speed computers for increased efficiency of operation.

The November 12 meeting was devoted to "Statistics in Hospital Planning". Dr. Herbert Klarman, Hospital Council of Greater New York, was the speaker. The discussants were Dr. Clement Clay, Columbia School of Public Health; Dr. Paul M. Densen, H.I.P.; and Monroe Lerner, Health Information Foundation.

At the December 10 meeting the subject was "Measuring Industrial Capacity". William H. Chartener, Economist, McGraw-Hill Department of Economics; Daniel Creamer, Director, Division of Economic Studies, National Industrial Conference Board; and Sanford S. Parker, Chief Economist, *Fortune* Magazine, were the speakers.

Professor Rosedith Sitgreaves, Teachers College, Columbia University, was the principal speaker at the December 16 meeting, which was devoted to "Recent Developments in Multivariate Analysis". The discussants were Professor Irving Lorge, Columbia University, and Dr. Joseph Zubin, New York State Department of Mental Hygiene and Columbia University College of Physicians and Surgeons.

Rochester

At the November 25 meeting, Dr. Richard Rosett, Assistant Professor of Economics at the University of Rochester, spoke on the problem of estimating the relationship between an independent variable (one or more) and a dependent variable which is zero for some values of the independent variable. For example, the price of a common stock warrant will be zero for expected values of the common stock which are below the purchase price stated in the warrant. Another example relates to working wives. For certain values of the independent variables (age, income of husband, number of children, etc.) the wife will not participate at all in the labor force. Dr. Rosett discussed how to obtain maximum likelihood estimates for relationships of this kind.

Saint Louis

"The 1959 Business Outlook" was the subject of the November 20 meeting. The members of the panel of speakers were: Carl Dauten, Professor of Finance, Washington University; William Abbott, Vice-President, Federal Reserve Bank; and George Coleman, Economist, Mercantile Trust Company.

The speaker at the January 15 meeting was Richard Fitzgerald, Sales Representative for Space Systems, McDonnell Aircraft Corporation. Mr. Fitzgerald's subject

was "What Are the Real Objectives of Forecasting?"

San Francisco

A luncheon meeting was held December 8 at which the speaker was Millard Cass, Deputy Undersecretary of the Department of Labor. The speaker at the January 14 dinner meeting was Ronald Welch, Chief of the Division of Research and Statistics of the State Board of Equalization. Mr. Welch's subject was "Sampling for Equalization of County Assessment Levels".

Southern California

Ward R. Drury, Associate in the firm of Booz, Allen and Hamilton, Management Consultants, was the speaker at the dinner meeting of December 4. Mr. Drury spoke on "Advertising Cost Reduction through Statistical Analysis", presenting a case history of how a consumer products company reduced costs through statistical analysis without reducing advertising impact.

Twin Cities (Minn.)

At the dinner meeting held on October 15 the Chapter heard John S. Chipman, Associate Professor in the School of Business Administration, University of Minnesota, speak on the subject of "Inventory Control". On the 13th of November Eugene A. Johnson, Associate Professor of Bio-Statistics at the University of Minnesota, spoke on "Are Statistical Designs in Medicine Useful Elsewhere?"

Dr. Bernard Lingren, Assistant Professor in the Mathematics Department of the Institute of Technology, University of Minnesota, was the speaker at the December 16 meeting held at the University of Minnesota. Dr. Lingren's subject was "Sales Forecasting".

The annual dinner meeting was held on January 20 at Napoleon's Restaurant in St. Paul. Dr. Guy Orcutt, Professor of Economics and Statistics at the University of Wisconsin, talked on "The Decision-Unit Model and Stimulation of the U. S. Economy."

The Chapter officers for 1959 are:

President—JOHN A. MCDONALD, head of the Research Dept., Federal Reserve Bank of Minneapolis

Vice-President—RICHARD I. SAVAGE, Associate Professor of Economics, School of Business Administration, University of Minnesota

Secretary—VIDA GRACE (MRS.) HILDYARD, Senior Statistician, Remington Rand Univac

Treasurer—GWENETH J. HEDLUND, Section Leader, Consumer Products Research, General Mills Central Research Laboratory

Virginia

The Virginia Academy of Science Chapter of the American Statistical Association held a joint meeting with the Richmond Section of the American Society for Quality Control in Lynchburg on October 25, 1958. Two papers were presented by members from each of the Societies and were of an expository nature. It is hoped that this is the first of an annual series of joint meetings.

Washington

The subject of the November 19 meeting was "Statistical Analysis in Meteorology". Donald Gilman, Extended Forecast Section of the Weather Bureau, discussed "Statistics and Long-Range Forecasting", and Herbert C. S. Thom, Office of Climatology of the Weather Bureau, spoke on "An Application of the mth Value Distribution in Meteorology". Discussants were Glenn W. Brier, Office of Meteorological Research, Weather Bureau, and Julius Lieblein, David Taylor Model Basin, Navy Department. H. E. Landsberg, Office of Climatology, Weather Bureau, was Chairman.

The December 17 meeting was devoted to an informal report on the current status and future development of the Federal Reserve work on flow-of-funds accounts and savings statistics. Stanley J. Sigel, Chief, Flow-of-Funds and Savings Section, Board of Governors of the Federal Reserve System, was the principal speaker. The discussants were Earl Hicks, Assistant Director, Research and Statistics Department, International Monetary Fund, and Kenneth M. Wright, Assistant Director of Economic Research, Life Insurance Association of America. The meeting was chaired by R. Duane Saunders, Assistant Chief, Debt Analysis Staff, Treasury Department.

professional society whose meetings we'd like to attend even if held separately. Most of us are members of at least one other society in addition to ASA. A large joint meeting of a number of these organizations offers many of us the opportunity to attend, in effect, ten or more different annual meetings. Third, we have before us a number of sessions on topics in or closely related to our fields.

Fourth, still another advantage of a large number of sessions is that it gives the "young fry" an opportunity to be heard. Obviously, this is of great importance in introducing the younger professionals into the societies on an active basis.

It is not intended that a person hear all the different papers given in a certain subject-area any more than you would expect to read all the books in the library on any one given topic. Yet this is a point which bothers some registrants. It is not uncommon to hear the complaint that two or more sessions, of interest to the members have been scheduled for the same hour. This, I'm afraid, is one of the occupational hazards of joint meetings, although schedules avoid it as much as possible.

I do not mean to give the impression that I believe any joint meeting to be just a jim-dandy affair with no improvements necessary. There's plenty of room to enhance both the programs and the arrangements, to wit:

(1) closer cooperation, *as the programs are being formed*, among the various program committees of the societies meeting together. This might help in avoiding so many individual sessions on similar topics and encourage more co-sponsored efforts. This would also permit the selection of the better papers offered for presentation.

(2) better and closer joint local arrangements, which would help in standardizing session times to a greater degree and take advantage of the best facilities available to each group (particularly in presenting papers of sweeping interest to all attendees).

(3) avoidance of conflict, wherever possible, of sessions of major interest (such as presidential addresses, meal functions, outstanding speakers, sessions dealing with items of general public interest, etc.).

The Program Committee of the ASA devotes a great deal of effort in endeavoring to build sessions of real interest and value to all members. Suggestions from the members both with regard to the content and the mechanics of the meetings are of great help. Several members have already made many helpful suggestions for the next annual meeting. We hope that others who have suggestions but have not yet sent them in will do so at once.

Summing up the recent meeting in Chicago, in spite of a fine program and well-developed publicity to our members, the attendance was disappointing. This may have been partly due to the time of the year (Christmas week) and the airline strikes which probably were a deterrent to some who live at greater distances from Chicago; these seem to have offset the attraction of a joint meeting. (Total registration at the Congress Hotel, ASA headquarters, was about 875, although the attendance of ASA members was probably over 1,000 if registrants at other hotels could be included.) Sales of the abstracts booklet went well for a first venture. Now that member interest and cooperation has been demonstrated by the fact that abstracts were published for about 90% of the papers, the abstracts booklet can be made available in the future in conjunction with pre-registration.

One final remark in reference to cooperation with other societies. At the Board and Council meeting held in Chicago, considerable discussion was devoted to exploratory efforts to establish a closer liaison with societies of similar interests. I shall endeavor to report more fully along these lines in future columns.

NEW NEBRASKA CHAPTER

The Board of Directors approved a charter for the Nebraska Chapter at its meeting on December 27, 1958. A meeting of the proposed chapter had been held on December 9, at which a constitution was adopted and the following officers elected:

President—BERNARD HARRIS, University of Nebraska

Vice-President—JOHN V. HARROP, Strategic Air Command

Secretary-Treasurer—JAMES B. HASSLER, University of Nebraska

Professor Frank J. Dudek of the University of Nebraska spoke on "The Proposed University of Nebraska Computing Center."